

# Amateur Radio

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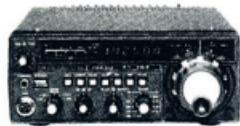
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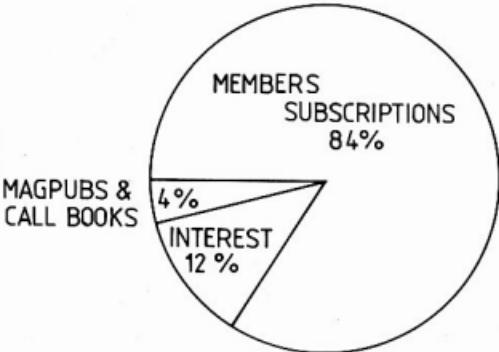
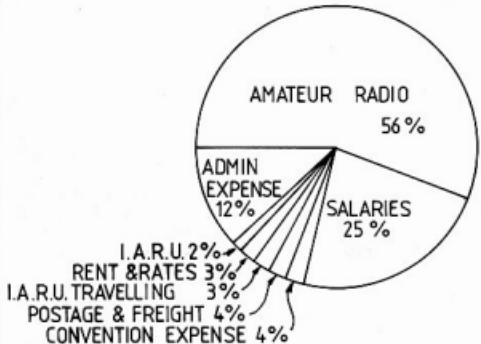


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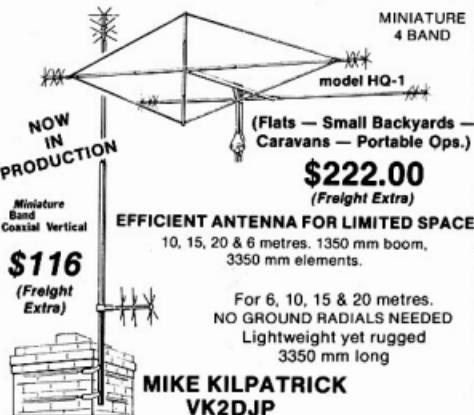
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# WIA NEWS

Department of Communications has granted the use of the special AX prefix and ITU suffix on the occasion of the World Telecommunication Day Contest.

Approval is given to the WIA to employ one station per division using the AX prefix and ITU suffix on 17 May 1983. No objection is seen to the use of the AX prefix by all amateur stations on this day.

## RADIO COMMUNICATIONS BILL 1983

The CASPAR Committee has studied the new Bill in detail, input has been received from several divisions and interested individuals.

By the time that you read this, CASPAR's report will be with the Federal Executive to form part of the WIA submission to the Department of Communications.

Following on from this, Michael Owen, VK3KI will present a paper at the IREE Radiocommunications Workshop, on behalf of the Wireless Institute, in Sydney on 26th and 27th April.

## SCRAMBLERS

Amateurs may have noticed that Scramblers have been advertised in a number of magazines. This equipment may be totally acceptable on frequencies allocated to some services,

however both International Regulations of the ITU and the Australian Regulations require all transmissions by amateur stations to be in plain language.

It is our understanding that the utilisation of a scrambler by amateur stations would be in breach of these regulations and amateurs are advised not to use scrambler devices in the amateur bands.

## 50-50.15 MHz

The Institute has replied to the Department of Communications request for comments on three options of amateur use of the 50-50.15 MHz segment.

The Institute has opted for option one with reservations and observations in an effort to get amateurs on the air and then continue negotiating.

## DOC MEETING

A joint DOC/WIA meeting was held on the 30th March and the following items were discussed. Visitor's callsigns, 50-50.15 MHz, Chess-on-the Air, Age limits, Examinations, Amateur Operators Handbook, Radio Communication's Bill 1983, 12/14 WPM Morse tests, ATV and Reciprocal Licensing.

AB

## PHOTO COMPETITION



To increase the interest and participation of members of the Wireless Institute of Australia in AMATEUR RADIO and through the courtesy of AGFA GEVAERT LIMITED, a competition with a difference will commence in the July issue of AMATEUR RADIO and run through to the June issue of 1984.

The competition is based on the best photograph that is reproduced in the magazine for this period pertaining to the hobby and may be a front cover, a photograph included with a story or technical article, or just a photograph of interest, suitably captioned.

The basic rules for this competition which will be known as the AGFA COMPETITION are:

- Only financial members of the WIA and their immediate families are eligible.
- Professional photographers, members of Federal Executive, the Publications

Committee, employees of the Wireless Institute of Australia, Agfa Gevaert Limited, Waverley Offset Printing Group and Quadricolor Industries and their immediate families are precluded from entering the contest.

- Only photographs submitted in the form of colour transparencies, colour

prints, B&W prints or negatives taken after the 1st March 1983 are eligible.

4. The prize, a superb Agfa Optima Flash camera that has been kindly donated by Agfa Gevaert Limited, will be awarded to the entry judged from the best photograph in each issue by the management of Agfa Gevaert Limited, Waverley Offset Publishing Group and Quadricolor Industries in July 1984. The lucky winner will be announced in the September 1984 edition of AMATEUR RADIO.

5. No correspondence will be entered into by the judges or the editor of the magazine regarding the competition at any time.

6. All transparencies, negatives and prints whether printed in the magazine or held in abeyance will be returned to the sender if suitably identified and marked.

# HOW DANGEROUS IS RF RADIATION?

## — Part Two

Here is the second in our series of articles on this most important subject. It is reproduced from Radio Communication February 1982 and is printed in its entirety. Next month we will publish the final item in this series covering Microwave RF hazards.

### RF HAZARDS AND THE RADIO AMATEUR

by Roger P Blackwell, BSc, G8IZV\*, and Ian F White, MA, PhD, G3SEK\*  
Reproduced from Radio Communication February 1982

The biological effects of RF radiation and their practical implications have received a great deal of attention in recent years. Papers on these subjects in professional and scientific journals abound. Unfortunately the echoes of these papers in the amateur radio press have often been ill-informed and in some cases sensationalised. The average radio amateur is left wondering whether RF hazards are truly a cause for concern and, if so, what to do about them.

The authors are radio amateurs who are professionally involved in radiological protection, one being a biologist and the other an environmental scientist. In this article they examine the potential hazards of amateur radio from the viewpoints of radiation biology, RF engineering and commonsense.

Normal good RF engineering practice automatically tends to control potential hazards to the station operator. At fixed stations the normal use of high antennas leads to very low environmental RF power densities in accessible places. Even in the less common cases where areas of relatively high RF power density are potentially accessible, the operator can still control the hazard by preventing access. The authors see no reason for treating RF hazards any differently from other hazards of amateur radio that are better-known, accepted and controlled.

#### EFFECTS OF RF RADIATION

The quantum energy of RF radiation, which determines what manner of interaction with matter takes place, is very low; orders of magnitude smaller than that required to cause ionisation of atoms or molecules. RF radiation is thus totally different in properties from the ionizing radiations such as gamma and X-rays. The most important effect of RF radiation on biological materials is the induction of rotation of electrically-polarised molecules, such as water. This rotational energy manifests itself as heat. This principle is employed in medical diathermy and the microwave oven.

A great deal of research effort is currently directed towards understanding the biological effects of RF. While the authors would not wish to discourage anyone from taking an interest in this work, they must emphasise that the interpretation of the experimental results is difficult for the layman, and that it is all too easy to jump to the wrong conclusions. The view of the overwhelming majority of Western sci-

tists working on this topic is that heating is the only biologically significant effect of RF. There are often reports, mostly emanating from Eastern Europe, of "non-thermal" effects occurring at extremely low power densities. Such reports must be regarded with suspicion, for they fail the basic test of scientific credibility: when independent workers have repeated the experiments the claimed results have not been observed. More credible effects have indeed been observed at RF power densities which, while not extremely low, seem low enough to suggest "non-thermal" origins; but closer examination has shown that they too can be explained by heating, and that what has been detected is the body's reaction to compensate for a very small thermal change induced by the RF field. Although such effects are of scientific interest, they have not been shown to be hazardous, bearing in mind that a "hazard" is a risk of harm.

Heating of a part of the body can be considered a hazard if the heat cannot be removed by the body's normal temperature-

regulating mechanisms quickly enough to prevent a temperature rise sufficient to damage tissue. Perhaps the most critical organ in this respect is the lens of the eye, because it is near the surface of the body, has no blood supply to remove heat, and has no capacity for repairing damage. Hence the oft-repeated warning about looking down waveguide. There is no evidence whatsoever that RF radiation produces long-term damage of the kind associated with ionising radiations, i.e. cancer or genetic damage.

#### RF EXPOSURE LIMITS

The Home Office and the Medical Research Council recommend that the maximum for continuous exposure is a power density of  $10 \text{ mW/cm}^2$ ; this limit may also soon appear in the form of a European Community (CEC) Directive. The figure of  $10 \text{ mW/cm}^2$  was arrived at over 20 years ago<sup>1</sup> and remains essentially valid today, despite close examination in recent years. Very similar limits are used in the USA and some other countries. Eastern Europe and

Russia have somewhat tighter standards—for example,  $10 \mu\text{W}/\text{cm}^2$ —but there is no valid reason for these from the Western viewpoint.<sup>2</sup>

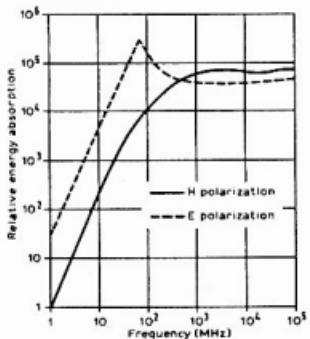


Fig. 1. Relative energy absorption versus frequency for E and H field orientations of an "average man".

Recent work has substantially confirmed the validity of the UK limit over the majority of the RF spectrum.<sup>3</sup> The absorption of energy by a given object depends on several variables, such as the frequency of the radiation, size of the object and the materials of which it is made. For frequencies above 500 MHz the amount of energy absorbed by, for example, an "average man" is relatively independent of frequency. At about 65-70 MHz man is more or less resonant, because his height is approximately half a wavelength; absorption of RF energy, if the subject is oriented parallel with the E-field, is therefore at a maximum and may be possibly 10 times that at 500 MHz. Absorption then falls off rapidly with decreasing frequency, at 10 MHz being less than 10 per cent of that at 500 MHz (Fig. 1). There would therefore appear to be much less of a problem with HF exposures. The  $10 \mu\text{W}/\text{cm}^2$  limit remains equally valid at all frequencies, although the "built-in" safety margins are less around the frequencies at which man is resonant.

## DETERMINING RF POWER DENSITY

It is very difficult to predict RF power densities in real-life situations, and none too easy to measure them. The reason for these difficulties is that power densities are likely to be highest close to the source, which is where the electric (E) and magnetic (H) components of the field are not at right-angles as they would be in the "far-field". The difficulty in measuring RF power density when the E-field and the H-field are not at right-angles is rather like that in measuring power in a reactive AC circuit, where the E and I vectors are not in phase. Just as one cannot determine power in the AC circuit by measuring E and/or I separately, one cannot determine RF power density in the near-field region by measuring the E-field and/or the H-field separately.

Very sensitive measurements can be made of the E-field (or less commonly of the H-field) but their interpretation is ambiguous. If one assumes that the two components are at right-angles the power density is simply calculated from the equation

$$W = E^2/Z \quad \text{W/m}^2$$

where E is the E-field in V/m and Z is the "impedance of free space" ( $377\Omega$ ). Although this represents the maximum possible value of W, and may be a considerable overestimate in the near-field region, "derived standards" of the maximum permissible E-field for particular circumstances can be calculated on this conservative basis.

A less ambiguous measurement of RF power density is based on direct detection of the heating effect, but instruments employing this principle are not very sensitive owing to the difficulty of measuring the very small temperature rises involved.

Even under laboratory conditions, accurate measurements of RF power density call for specialised instruments and great care. It is not possible for amateurs (or indeed professionals) to measure near-field RF power density with normal communications test equipment.

However, commonsense suggests that situations in which RF power density *may* be high are best avoided as a matter of principle, even if they may not prove unduly hazardous in practice. Generally speaking, the larger the quantity of RF energy and the smaller the area in which it is confined, the higher the RF power density. Fortunately most of the undesirable situations represent bad engineering practice for other reasons, and some of the authors' strictures are as much against the bad practice as against the RF hazards that might result.

## SITUATIONS TO AVOID

1. RF exposures leading to an actual sensation of heating are far in excess of  $10 \mu\text{W}/\text{cm}^2$ , and are definitely to be avoided!

### 2. Looking down a waveguide

The classic example in which RF energy is confined into a small area (about  $3 \text{ cm}^2$  for WG16), and applied to sensitive tissues (the lens of the eye). NEVER look down a wave guide unless you are quite sure there is no RF source at the other end!

There is a tendency to single-out microwave radiation as being especially hazardous. This is not correct, as Fig. 1 shows, though the practical situations in which high RF power densities could occur may not readily be anticipated by beginners who are unfamiliar with microwave technology. However, the level of skill required to generate large amounts of microwave power should be more than sufficient to anticipate and avoid the potential hazards.

### 3. Working on high power VHF/UHF amplifiers with the covers off

Quite apart from the potential RF and high voltage hazards, testing an amplifier with a cover off the anode circuit is unlikely to be useful, for the patterns of circulating RF currents may be entirely changed.

Sadly there is no substitute for the use of a large number of securing screws, or for

the tedium of removing and retightening them all, each time a change is made. Note that even a narrow gap between two covers can make an effective slot radiator if it is an appreciable fraction of a wavelength long; never peer through such a gap. If access or viewing ports are essential, round holes are best; for example, a hole of about 2 cm diameter results in very little RF leakage at 144 MHz.

## 4. Using a small antenna in the shack as a dummy load

This is very bad practice; the use of a proper screened dummy load is essential. Quite high RF power densities can be achieved close to small antennas such as VHF/UHF dipoles if the RF power level is a few tens of watts or more.

## 5. Adjusting energised antennas

This is also bad practice. "Live" adjustment is very convenient, but it can and should be done at very low power levels.

## 6. Using handy-talkies with "rubber duck" antennas

This is not necessarily to be avoided as being unduly hazardous, but it does lead to higher RF power densities in sensitive tissue (the eye) than almost any other activity in amateur radio<sup>3,4</sup> and it is of course a very common practice.

The E-field at the end of a foreshortened antenna such as the "rubber duck" (or normal-mode helix, to give it its proper name) is greater than that at the end of a full quarter-wave, and on a handy-talkie the end-cap of the "rubber duck" can come quite close to the eyes and face. Extremely close contact with the end of the antenna is usually prevented by a very thick insulating end-cap on commercial antennas of this type. The authors strongly recommend amateur constructors to take similar precautions; for direct contact with the un-insulated end of a "rubber duck" could cause a corneal burn at power levels of only 1-2 W.

## ENVIRONMENTAL RF FIELDS

So far in this article the authors have concentrated mainly on potential RF hazards to the station operator. In order to obtain some indication of typical RF power densities generated in the environment of amateur radio stations, they also made a limited survey of fixed stations.

**STATION A.** 300 W PEP RF output on 144 MHz, to a 16-element Yagi on an 11 m mast beside the house. Maximum power density near ground level occurred at 35 m from the base of the mast in the direction of the main beam, and was  $0.03 \mu\text{W}/\text{cm}^2$ ; at a distance of 60 m the power density had fallen to  $0.0003 \mu\text{W}/\text{cm}^2$ , the detection limit of the instrument in use. No fields could be detected at the base of the mast or in the shack or the rest of the house.

**STATION B.** 400 W PEP RF output on 144 MHz, to a 16-element Yagi 3 m above the centre of the roof. Inside the loft, at the peak of the ridge directly below the antenna, the indicated RF power density was  $0.2 \mu\text{W}/\text{cm}^2$ . Otherwise the results were very similar to those for station A.

**STATION C.** 400 W PEP RF output on 432 MHz, to a 20-element loop Yagi on an 11 m mast beside the house. No RF field was indicated (ie less than  $0.0003 \mu\text{W}/\text{cm}^2$ ).

in the shack, anywhere outside near ground level, or even when leaning out of the bedroom window.

**STATION D.** 400 W PEP RF output on 28 MHz to a TH6DXX multiband beam, which behaves as a four-element Yagi on 28 MHz. The beam is mounted on a crankup tower, 20 m from the house. With the beam at a height of 11 m, pointed at the house, the power density at the nearest upstairs bedroom window, 7 m below the plane of the beam, was 0.01 mW/cm<sup>2</sup>. The greatest power density observed outside, close to ground level, was 0.06 mW/cm<sup>2</sup> at the foot of the tower.

Although the above information is circumstantial, and could not be used to accurately predict RF power densities at other locations, the general conclusions are clear enough. In all cases the measured power densities were very much less than 10 mW/cm<sup>2</sup>, even though the stations concerned were using powers up to the UK legal limit. Two of the stations had kilowatt permits for experimental work, and it is clear that the increase in power beyond the normal limit would introduce no appreciable hazard. In this survey the highest RF power densities encountered were where the height differences were small: in the loft at station B, and upstairs at station D when the tower was retracted.

In order to obtain any appreciable environmental RF power density, therefore one needs the rather unusual combination of high RF power but a low antenna. Virtually all fixed stations have antennas high enough to preclude the possibility of anyone approaching them closely; this is another example of the way that normal good practice tends to control potential RF hazards without any special precautions to that end.

One possible exception to this general rule is the ground-mounted  $\lambda/4$  vertical

antenna, especially on 28 MHz. A recent calculation<sup>3</sup> has shown that standing very close (20 cm) to a 27 MHz ground-mounted  $\lambda/4$  vertical fed with 140 W of RF can lead to the same energy absorption as would standing in a 10 mW/cm<sup>2</sup> plane-wave field. However, the energy absorption is considerably reduced if the subject is not perfectly grounded.

### MOBILE OPERATION

In mobile operation the antenna is low, but in most cases the RF power is also low. There is an effective limit of about 100 W RF output because of the drain on the battery while stationary, and in the UK the legal power limits are only a little above this level. Even when using such power levels, the operator can still control any RF hazards simply by making sure that nobody remains close to the antenna while the transmitter is in use, or by refraining from transmitting high power if anyone is close by; and of course the problem disappears when the car is in motion.

### CONCLUSIONS

Heating appears to be the only biologically-significant property of RF energy, and is only a hazard if the heat cannot be removed quickly enough by the body's thermoregulatory mechanisms.

Absorption of RF energy by the human body diminishes rapidly with frequency in the HF region, and is relatively constant in the microwave region. The slightly enhanced absorption occurring near the resonant frequency of the human body is not a major cause for concern.

Normal good RF engineering practice automatically tends to control any potential hazards to the station operator. However, commonsense suggests that situations in which RF power densities may be high are best avoided as a matter of principle, even if they may not prove unduly hazardous in practice.

At fixed stations the normal use of high antennas tends to reduce the environmental RF power density in accessible places to very much less than the maximum levels considered acceptable.

Even if areas of relatively high RF power density are potentially accessible, the operator can still control any hazard by preventing access or by not transmitting when anybody is in such an area.

The authors see no reason whatever for treating RF hazards any differently from other hazards of amateur radio that are better known, accepted and controlled, eg high voltages or falling antennas. There is no case for introducing any special regulations, on any amateur band, aimed at controlling RF hazards due to amateur radio.

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## INTERNATIONAL NEWS

### NEW INTERNATIONAL FOCUS FOR 73 JOURNAL

Beginning with its April issue, *73: Amateur Radio's Technical Journal* will be offering a new column, "73 International".

Written by columnists from around the globe, "73 International" will offer its readers a broader knowledge of amateur radio activity throughout the world and provide foreign amateurs with an international outlet through which they can publicise their operations.

The April issue will include columns from India, Hong Kong, Taiwan, Korea and Papua New Guinea, Guam, New Zealand, Chile, Brazil, Switzerland, Austria, Sweden and West Germany will also be represented in that issue.

By fostering an international forum for amateurs, *73* hopes to encourage the growth of amateur radio worldwide and to cross the

traditional boundaries of technological co-operation. Further information is available from Avery L Jenkins WB8JLG.

### AMERICAN RADIO RELAY LEAGUE NATIONAL CONVENTION

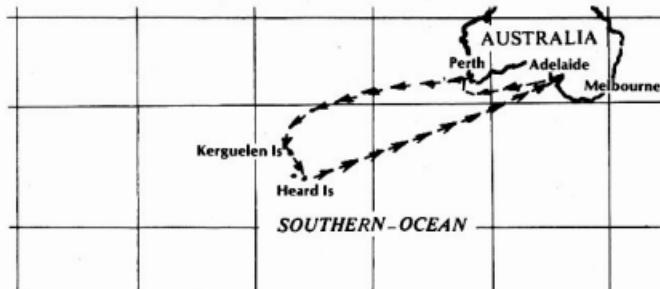
The 1984 ARRL National Convention will be hosted by the Hudson Division at the New York Statler, on the weekend of 20-22 July. The popular event, which usually attracts amateurs from every one of the fifty United States, all Canadian provinces and many countries abroad, is scheduled to feature numerous activities including technical and operating seminars, social events, banquets, DX meetings, manufacturer's displays showing the latest equipment designs and unlimited activities for non-amateur spouses.

The New York Statler is situated in the heart of the city, which provides visiting amateurs and their families easy access to its many cultural attractions. Broadway's famous theatre district, the Empire State Building, the World Trade Centre's twin towers, the bohemian Greenwich Village artists' colony, plus opera houses, museums and numerous restaurants featuring cuisine from nearly every nation, are all within minutes of the hotel via taxi, bus or subway. The hotel itself offers every amenity of a cosmopolitan inn, including dining rooms, conference rooms, lounges and a Grand Ballroom which can accommodate up to 2000 people.

Detailed information and registration forms may be obtained by writing to Mike Troy, AJ1J, R.R. 4 — Box 19C, Pound Ridge, New York 10576, USA.

# To Heard and Back

Dave Shaw VK3DHF/VK0HI,  
9 Milton Street, Heathmont 3135



In December 1982 a group of mountaineers, scientists and radio amateurs sailed aboard the maxi-yacht Anaconda II to the Antarctic wastelands.

This month we begin a two-part story by Dave Shaw VK3DHF, the leader of the radio component of the successful operation of VK0HI and VK0CW and the triumphant ascent of Big Ben, the highest mountain in Australia and its territories by the mountain climbers. As there is a high pictorial content it was decided to run this article over two issues.

My journey began on a warm night in Melbourne with a bus trip to Adelaide, the port from which the Anaconda II was going to depart. As I was carrying half of the display material for our Audio Visual the next night it was fortunate that the service was new with few people travelling and plenty of room for my gear. It was thought this would be the most uncomfortable part of the trip, but with twenty people to embark on Anaconda II in Perth, I was quite wrong.

This story starts in early March 1982 with a telephone call from Perth when Nick VK6XI rang and without introduction asked if I was about twenty eight and reasonably fit. With an affirmative answer, he continued by asking if I would like to go to Heard Island. This was reasonably startling and one couldn't help wondering if it were a joke.

Nick probably realised this and gave me his telephone number and asked me to call him if I was interested. It took me approximately ten minutes to return his call saying that I would accept the invitation.

From my side things moved very slowly. All my questions and fears were allayed continually with regular reports from the VK6 DX Chasers Club (VK6DXCC) through Nick and Neil VK6NE.

*This exercise turned out to be the most damaging.*

A meeting with the organisers of the trip, the mountaineers, in August firmed arrangements and I was convinced that the trip was feasible and safe!

Word from Perth about equipment and other operators was also very promising and other than the canvassing of friends and acquaintances for associate membership the worry, frustration and work of putting the expedition together was in the hands of the VK6 DXCC and the mountaineering group in Sydney.

My responsibilities consisted of physical training and also an exercise on the inflatable rubber boats (IRBs) at Portsea

Surf Lifesaving Club, which is located south of Melbourne. This exercise turned out to be the most damaging and demanding part of the whole trip.

The surf endured at Portsea during the training turned out to be at least twice as large as that encountered at Heard Island, therefore valuable experience and confidence in handling of the boats was obtained. Due to mishaps during training, swimming in the cold rough surf became a necessity and the fear of drowning and being rescued from the sea was eliminated.

My interest in six metre operation saw the assembly and testing of a complete VHF installation. This was done in Melbourne with the help of Gil VK3AUI and Lionel VK3NM, both dedicated VHF enthusiasts, and a beam to complement the station was manufactured and loaned by Werner VK3BWW.

With the VHF equipment taken care of, a trip to Sydney in early December was necessary. The main object of this trip was to meet other members of the expedition

and assist with the packing of rations and sorting of clothing and all the other necessities so that it would be ready for despatch to Adelaide for an anticipated departure date of mid December.

During this period other members of the expedition were involved in Audio Visual lectures around Australia in efforts to canvass more support and give the public a picture of the broad spectrum of activities to be carried out whilst on the island.

On arrival in Adelaide, it was off to the boat to start packing and get my first view of "home" for the majority of the expedition. The Anaconda II is reasonably easy to pick out at any wharf with a length of 25 metres and its 28 metre mast plus towering above other yachts in the vicinity.

The packing and stowage of food and supplies for the voyage was to take the next four days. With twenty people to be on board, approximately five tonnes of provisions and equipment had to be safely stored.

#### *Leaky fuel line did contaminate some food.*

As most of the food had to be stored in the bilges, that are located under the floor of the boat, it was necessary to pack it into large plastic garbage bags. This was to reduce the amount of salt water ingress and, in the case of cans, to eliminate any small amount of rust getting back into the bilges.

It was an effective method for sea water, its usefulness for diesel fuel was strictly limited as we found out when a leaky fuel line did contaminate some of the food and with so many nooks and crannies filled with food it was sometimes hard, with the continual pitching of the vessel, to raise the floor and utilise the stocks fully.

With the majority of our food supplies aboard (fresh vegetables and meat were to be loaded before we departed from Perth, our last Australian port of call), we departed from Adelaide for the west to pick up the rest of the expeditioners. Only five expeditioners did this part of the trip, as the rest headed for Perth to organise the last Audio Visual, and the remainder of the equipment needed for the trip.

This was a wise move as most of us had very little sailing experience and with only five on board for this leg of the trip it allowed the skipper and crew time to teach us a little of what would be expected of us on the journey.

For the captain and crew of the Anaconda II, this was the true beginning of the voyage, Adelaide being Anaconda's home port. There were many relatives, friends and well wishers for our send off including the Mayor of Port Adelaide, Mr Roy Martens. His interest, as well as many others in Port Adelaide, in the expedition showed itself on our return.

Sailing the Anaconda is a very involved business, especially when considering that for the first few days on board the inexperienced were hanging over the side. The trip to Perth and subsequently to the island all on board had to do their shifts to keep the boat on tack. We were divided into two watches — one watch on deck at all times in three hour rotating shifts. This was compulsory and no one missed out.

Even now with two months of sailing behind me, getting to the right winch or halyard still cannot be done without a bit of thought first. Fortunately Josko Grubic, the skipper, allowed quite a bit of leeway when he built the Anaconda with extra stays and heavy rigging for a crew of raw recruits such as ourselves.

Communication during this part of the voyage was maintained with a daily schedule to VK6NE and VK5QX, with no problems encountered on forty and twenty metres. This was in contrast to the commercial schedules which were sometimes not so fruitful.

Equipment on this well designed vessel, consisted of two commercial crystal locked transceivers using the backstay as an aerial. A VHF marine band transceiver and an Icom 720A with antennae matching unit operating into a vertical on the stern of the boat, comprised the other communications equipment.

This radio equipment was all battery powered from the ship's supply and its drain and that of the satellite receivers, other navigation instruments and internal lighting, meant that to operate for long periods required excessive generating times from the ship's alternator which was not practicable.

Our training period on the first leg of the trip, although nothing like what we were to encounter in the southern latitudes, did serve to give us a bit of confidence on the boat, and the knowledge of where to run to when our muscle was required.

Most of the Adelaide-Perth trip was a relatively cosy time. The vessel was becalmed for two days and had light winds for most of the voyage and if the rest of the journey was to have been like this, we would indeed have been suntanned, healthy, happy and fit.

After nine days, we tied up at the Port of Fremantle, the port which services Perth, to be greeted by some of the amateurs who had donated so much time, money and effort to make the trip possible. These included Neil VK6NE, Don VK6DY, Nano VK6UN.



Anaconda II en route to Perth.



Arrival at the Port of Fremantle.

The boat's arrival at Fremantle caused quite a bit of interest, because of the VK6's involvement in the DXpedition and it is hard now to recall the names and callsigns of all those well wishers who arrived and looked over the Anaconda.

Soon after landing, I was whisked away by Don VK6DY for a much needed shower (there are no mod cons such as showering facilities on board the yacht) and get a bit of washing done before meeting the rest of the DX Chasers Club and the two other operators who had arrived from the United States a couple of days previously.

Meeting all the members of the VK6 DXCC and seeing the assembled equipment was a pleasant surprise. The group in Perth had organised all of the HF amateur radio aspect of the trip and now seeing them and meeting Al VK6AHI/VKOCW and Chuck VK0MD, the American operators, it felt good to be an integral part of this expedition. It is regrettable that Chuck had to pull out of the group at the last moment due to personal problems back in America.

*Everyone tried to get the maximum gear aboard*

As we were going through the amateur equipment, preparations with the mountain climbers and at the boat were also moving along rapidly.

The amount of gear to be taken on board now started to assume very large proportions with everyone trying to get the maximum amount of gear on board. I am certain the captain would have had a "heart attack" if he could have seen everything assembled on the wharf, but secreted away on board the gear was acceptably unobtrusive.

One or two days was the expected stay over in Fremantle, but this stretched to eight days as so much gear was assembled in Perth it was not possible to take it all and much reshuffling took place. Also some work on the Anaconda had to be done, which showed up on the trip across the Bight. Unfortunately arriving on Christmas Day did not help to get this work done expeditiously.

With the whole expedition assembled and the keel lying a few more centimetres in the water, we departed on the last day of

the year for our destination, Heard Island.

Now we settled down to sailing and learning more about the yacht. Al VK6AHI/VKOCW and I saw each other at watch change during the voyage down, with the schedules to Australia being taken care of by the one on duty at the time. Al and I shared the same bunk, as with only sixteen bunks and twenty people on board most people had to "HOT BUNK", which is, two people use the same bunk and when one is on watch the other is in the bunk, sleeping.



*Anaconda beating through heavy seas in the Southern Ocean.*

Photograph — Ross Vining



*Some of the supplies ready to be loaded in Perth. A mountaineering tent is in the right foreground.*

Sleep became an important commodity during the eighteen day voyage to Kerguelen Island and it became increasingly difficult to wake people for the next watch.

This was not only due to the lack of sleep but with no heating, a nice warm sleeping bag and the gentle rolling of the boat became an exclusive respite.



*Tacking the boat.*

Life on deck, as we approached the southern latitudes, changed from relaxed cruising to cold hard work. Changing sails with half a metre of water continually



*Entering Kerguelen Bay as a Russian Trawler departs.*

washing across the deck with thirty and forty knots of wind is not something to look forward to. Whereas thirty minutes at the helm, with the wind and swell trying to push us all about the ocean, had one sweating and exhausted.

After eighteen days on board it was a welcome relief to have a couple of days rest at the French base on Kerguelen Island. Here we were made very welcome, firstly with showers for all those on board and a relaxed dinner in the island's mess.

Kerguelen is a large sub antarctic island about two days sailing from Heard, with a large French scientific base. There are about one hundred people on the base for the winter period.

One of the first people to meet us was Michel FB8XAB, home call F6GVH, who was on the base for the summer period. He showed both Al and myself around the base, arranged for our accommodation, shower and washing needs. Then refreshed we operated FB8XAB for the rest of the night. This caused some confusion on the bands. Most of the Europeans did not expect FB8XAB to come on the air with either an American or Australian accent.

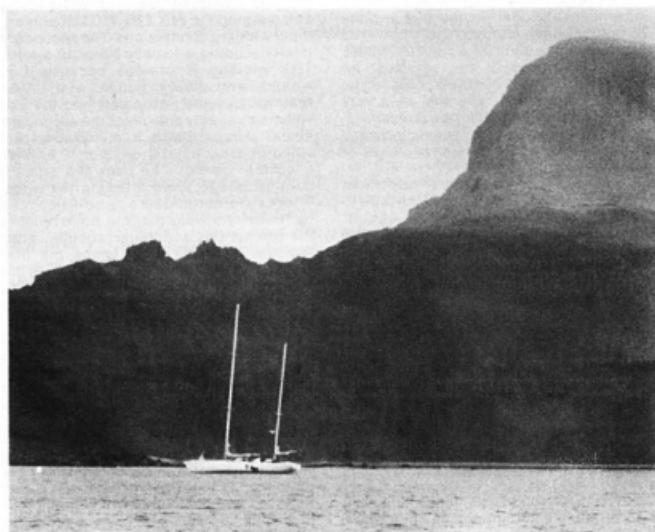
*Good French food  
and wine occupied  
our stay*

Al and myself were keen to get some operating in before the onslaught at Heard and Michel gave us this opportunity over the couple of days we were there. Between both of us we managed several hundred contacts considering the restricted amateur operating times that the French authorities have imposed on amateurs at Kerguelen due to the commercial daily traffic from 0900 and 1400 UTC.

Filling ourselves with good French food

and wines also occupied much of our stay. The inhabitants of the island showed the whole group great hospitality and after a few after dinner drinks the language difference did not pose many problems.

We were sad to leave the French base and the new friends we would probably never meet again, but our destination was still several hundred kilometres to the south, so we departed on the 20th January on the final leg.



*Safely anchored in Atlas Cove — Heard Island.*

The seas south to Heard Island were the largest we were to encounter with about a twelve to fifteen metre swell whipped up with up to about fifty five knot winds. This could not dampen our enthusiasm however and after a day we sighted the McDonald Islands followed that afternoon by our first glimpse of cloud covered Heard Island.



DAVE VK0HI



AI VK0CW

Photography unless noted by Dave Shaw VK3DHF.

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*To be concluded in June issue.*

# 13.8V REGULATED POWER SUPPLY

Des Greenham VK3CO  
23 Stewart Street, Seymour Vic 3660

*In these days of "black box" operation, it can be refreshing and rewarding to actually build something that works, especially when the cost is minimal. After all, most amateurs seek the "best" at the lowest possible cost. The power supply to be described has a regulated output of 13.8 volts DC adjustable, with a maximum load of around 10 amps. This is more than enough to drive the average 2 metre FM unit with an output of 25 watts.*

## GENERAL DESCRIPTION

The actual layout and construction details will be left to the constructor as they are not critical. The heart of any power supply is the transformer and this can be quite a costly item. In this case the transformer is one recovered from an old B & W television set, many of which are resting as junk in shacks or even obtainable from the local "tip". The transformer is partly rewound by stripping away the original secondary winding and replacing with a heavy duty 18 volt winding. This operation, whilst time consuming, is interesting and certainly not difficult.

The 18 volt winding is fed into a conventional bridge rectifier unit and the DC output is then controlled by a UA78HG regulator which controls a bank of 2N3055 transistors. These of course, must be mounted on a heavy heat sink. This can be either a commercial type sink or a very heavy piece of aluminium or copper "U" section material. This sink is best mounted on the outside of the case to allow better heat dissipation.

Components these days are most reliable. However, should one of the regulating transistors develop a "short circuit" then the output voltage would instantly rise to a dangerous level, causing damage to valuable equipment. Most 12 volt units can only stand a maximum of 15 volts before damage occurs. It is desirable therefore that there be some form of protection against high voltage. Many power supplies have the popular "crowbar" protection, in which, when the voltage exceeds a set value, a Zener diode conducts and "fires" a SCR which in turn short circuits the output and blows a fuse.

In this supply, the cost of protection has been cut by fitting a 15V Zener diode across the output. In the event of the voltage rising above 15 volts, the Zener diode will conduct and "short" the output thus protecting the equipment. The current carried by the Zener diode is far in excess of its rated current and therefore the diode is destroyed. When the Zener diode is

destroyed, it invariably becomes short circuit and the DC fuse will be blown thus completely isolating the equipment. The only cost for repair would be the faulty regulating transistor and a Zener diode. However, this is a remote risk and may never happen. It is re-assuring to know, nevertheless, that there is some form of over-voltage protection for valuable equipment.

## CONSTRUCTION DETAILS — TRANSFORMER

The TV power transformer should be carefully examined for any damage. It should be removed from the chassis noting and marking the 240, 220, 210 volt primary input winding connections. The secondary heater winding is usually 6.3 or 12.6 volts. This winding is obvious because it is wound with heavy gauge wire. After removal, connect the primary to the 240 volt mains supply and check the secondary heater winding with a multimeter (AC volts) to ascertain if it is 6.3 or 12.6. After checking, carefully tie back the primary connections to avoid breaking the wires. The transformer should now be dismantled by firstly removing the four bolts holding the laminations and frame together. After removal of frame and clamps the first lamination should be removed. This is the most difficult part of the entire project as these are usually pressed in by machine and difficult to remove. A thin bladed screwdriver driven in between laminations can frequently enable one lamination to be gripped by long nosed pliers and removed. The laminations are usually in an "E" and "I" shape configuration and should be completely removed and stacked.

The heater winding is on the outside, and should now be carefully unwound making sure to count the turns as they are removed. When this winding has been removed and the number of turns noted, the remaining secondary winding can be stripped either by unwinding or careful use of a hacksaw remembering that the primary winding underneath is to be re-used. Some

transformers from Astor and AWA sets have a double bobbin winding with primary on one side and secondary on the other. These are particularly easy to rewind. The more usual type have the primary against the core, then the high voltage secondary and finally the heater winding on the outside.

Having stripped the bobbin down to its basic primary winding, the turns ratio of the transformer must be calculated. The "turns per volt" figure is found by dividing the turns counted by the heater winding voltage. This is nominally 6.3 or 12.6 volts. However most manufacturers wind transformers for 6.5 or 13 volts to allow for a voltage drop. It is common to find that the 12.6 volt winding has 39 turns. The "turns per volt" figure would be

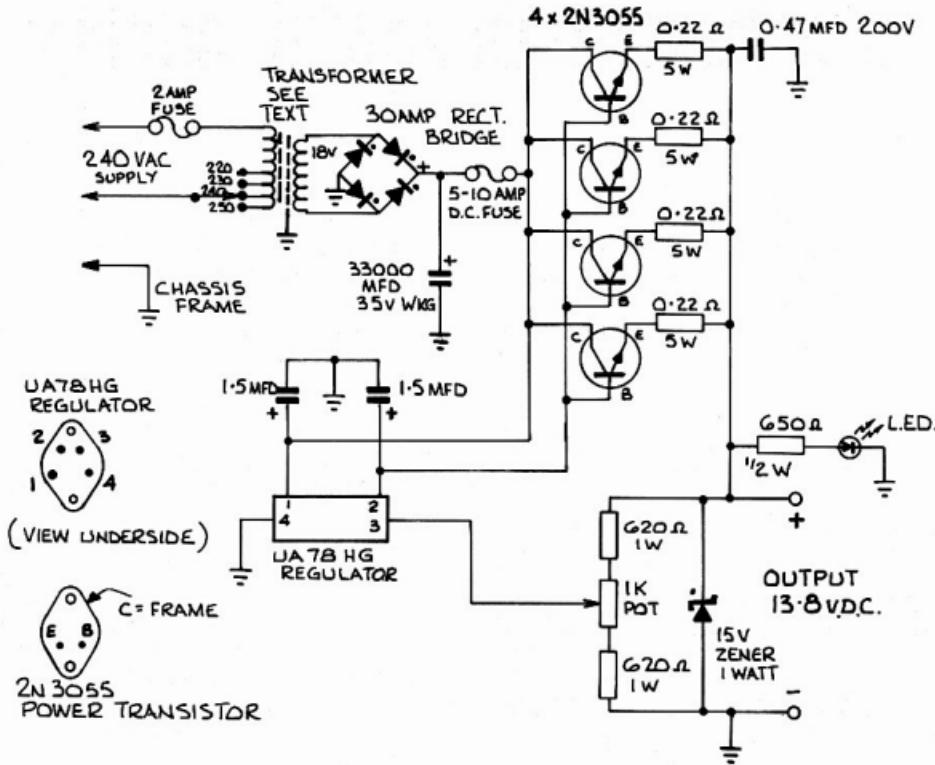
$$\frac{39}{13} = 3$$

This means we need 3 turns on the secondary for each volt of secondary output. In our case we need 18 volts, therefore we would need  $3 \times 18 = 54$  turns. This is only an example and you must calculate for your particular transformer to obtain 18 volts output.

To rewind the secondary we need wire that will supply 10 amps without overheating. 14 Gauge B & S is adequate and can be purchased from retailers or automotive electricians. A length of 10 metres should be enough for an average transformer. The winding is wound on carefully layer by layer, although it can be "jumble" wound if there is enough space.

The turns must be carefully counted and when the winding is complete a layer of PVC tape should be wound around it. The ends should be covered with spaghetti and extended out in a similar way to the original heater winding. Now the core must be replaced by fitting the laminations back to the bobbin. If the laminations are the "E & I" type, it is easier to fit 3 "E" sections at a time alternating the direction. The "I" pieces can be fitted later.

It is part of "Murphy's Law" that all the laminations removed will never be re-



Power Supply 13.8 V Regulated

placed, so do your best. The last few will be difficult to fit and careful use of a small hammer will assist. The assembly should be tapped into square shape with the hammer and the 4 bolts and mounting plates fitted. When finally together and looking like original, connect 240 AC to the primary and check the secondary voltage. If your calculations have been correct and all care taken your meter will read 18 volts. If your reading is not exactly 18 volts, you can adjust by changing the primary tapping. By connecting 240 volt mains to the 250 volt tapping, the output will be dropped and similarly connecting to the 230 volt tapping will increase the output.

#### CONSTRUCTION — GENERAL

The general assembly of the power supply will be left to the constructor. The transformer should be well mounted and all bolts tightened to prevent "buzz". The regulator can be mounted in any position and does not require any heat sink. It can be mounted on a small piece of aluminium

placed into a bracket. It is important that the 1.5  $\mu$ F bypass capacitors be mounted directly on the regulator itself and not wired away. The output fuse should be rated only marginally higher than the maximum load expected. To operate a set such as the IC22S a fuse rating of 5 amps would be adequate. The main filter capacitor, shown as 33,000  $\mu$ F, is from a disposal computer power supply.

Any value larger than 25,000  $\mu$ F would be acceptable and this could be made up from several smaller capacitors wired in parallel. An example could be 5 capacitors, each of 5000  $\mu$ F, wired in parallel. Be sure the voltage rating is adequate. Any rating higher than 30 volts working is sufficient.

After completion of wiring and circuit check, set the voltage adjustment potentiometer to the "low" end (earthy side). This will protect the Zener diode in the event that the output voltage is in excess of 15 volts. Connect an accurate voltmeter or multimeter to the output and switch on AC supply. Carefully adjust the potentiometer

until 13.8 volts is noted. The LED should be glowing. When satisfied that all is well, connect transceiver and check with another station for any noise or hum. The supply is clean and hum is not discernible. Check the voltage reading when the transmitter is operated. The drop should be barely noticeable. With the values shown and a transformer of the TV type, an output of 10 amperes, well regulated, will be available and there will not be too big a dent in your domestic budget.



Please remember your STD code when you advertise in HAMADS.

# How much can a 290R take?



Recently, whilst on a working assignment, two amateurs and two of their workmates had a miraculous escape from a helicopter crash. Along with the lucky survivors was a much loved Yaesu 290R.

Most amateurs take great care of their rigs, certainly they make sure they don't drop them.

Dale VK3DXB is meticulous about his Yaesu 290R. He even made a special leather cover for it, but he recently dropped his from 500 feet. His second problem was that he fell with the 290 — fortunately both survived and both are in good working condition. Not a scratch on either.

Dale and Chris VK3VYS, along with a stills photographer, were filming the low water levels in the Eildon dam for the Victorian State Electricity Commission when the Bell 206 helicopter they were using suddenly lost power and crashed from 500 feet.

Both Dale and Chris work with the SEC Film Unit which early this year won a national award for one of their films (AR, February 1983).

Dale had taken his 290R on the assignment to see how far he would be able to work RML, the Melbourne two metre repeater, from the air.

"I thought it would be interesting to test the range of the 290 during the trip home from our assignment which was to film four

of the water storages in north-eastern Victoria — unfortunately I didn't get the chance," Dale said.

"We had just finished shooting a sequence at Eildon when the helicopter went into an uncontrollable spin and crashed into the dry bed of the dam.

"The helicopter flipped as we hit the ground and one of the rotors crashed through the cabin. The pilot really did an amazing job getting us down as well as he did.

"The four of us scrambled out of the wreckage and ran away from the helicopter as there was aviation fuel everywhere and we expected the whole thing to catch fire.

"While we sat and tried to recover our senses and waited for the wreckage to cool down and help to arrive, I could see the 290 swinging from its strap. Later we were able to remove our gear from the wreckage."

Later on his way home, Dale was able to prove the value of amateur radio and the reliability of modern equipment, when he used the 290R to call RML and ask another station to pass a message to his wife that all were safe and were on their home — by car.

AK



LtoR — Dale VK3DXB, Chris VK3VYS and Ern Ward, stills photographer after their lucky escape.

Photograph — Alan Weekes.

## Bill Blitheringtwt goes on Air

A continuing saga by

Ted Holmes VK3DEH.  
20 Edmund Street, Parkdale, Vic 3195



His hand stretched out and switched on the ancient power supply. Bill Blitheringtwt was about to go on air using one of those new fangled black boxes: an all solid state multiband transceiver, complete with LED frequency readout and a variety of knobs for many and varied functions. He had purchased the rig that morning and just couldn't wait to try it out.

His old rig had died rather suddenly the previous day, owing to years of tuning through a defective ATU into a primitive antenna system. The glass envelopes of the finals had melted and were now a 1/4 inch high. It had been a spectacular effect, added to by the generous sparking created when Bill aimed a soda siphon at the blazing rig, without first disconnecting the power system from the mains.

Bill then turned on the new black box. Unfortunately, his power supply was not the best and, of course, he had not checked it first. At switch on, the voltage immediately shot up and the lights in the black box grew bright, then died. Despite all Bill's efforts — which included switching the power supply on and off again several times — the brand new black box refused to come to life again. He signed and made a mental note to return the unit to the suppliers. He could always have it fixed under warranty. . . .

He reached for his old and trusted ex-Army unit. No matter what he did, he had been unable to destroy that! So far, that is. He plugged it in and switched on. This was beautiful! He could hear a QSO in progress on 20 metres and decided to try to get into it. Locating the analog exactly on the frequency, he started to tune.

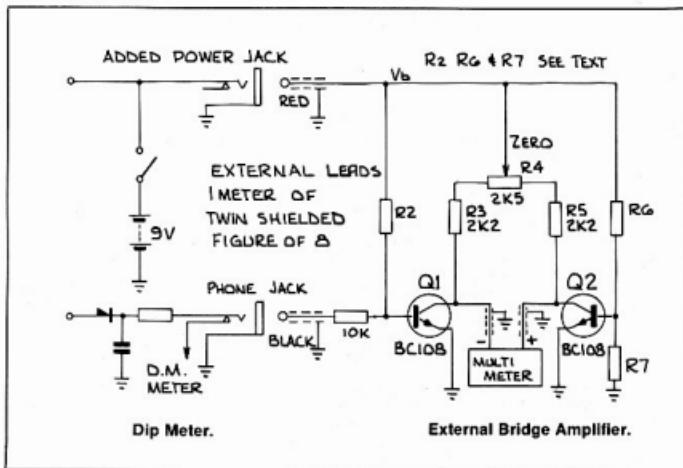
Doing this, he almost destroyed the QSO which was going on but, undeterred, he waited. At a suitable time he inserted his call sign. There was a pause and the QSO resumed. He called again. No reply. The voices disappeared but he found them about 20 kHz up. Not understanding all this, Bill decided that some people were not very friendly.

—oo—

# INCREASING THE SENSITIVITY OF TRIO DIP METER DM-800

P J Grigg VK3APG

Lot 44 Glenburn Street, Newcomb Vic 3219



With some circuits the dip on the Trio DM-800 was found to be only just perceptible. It was much improved by the addition of the following differential amplifier. The amplifier was built into a separate small metal box, suitably spray painted and labelled with rub down lettering. The only modification to the dip meter itself was the addition of a 3.5 mm jack, to supply 9 volts to the amplifier.

## DIP METER

Remove the metal cover on the phone jack side and enlarge the nearby cover fixing screw hole to match that of the phone jack. Drill a corresponding screw hole on the chassis to accommodate a 3.5 mm jack. Fit the jack, wire to the positive 9 volt rail and test. Re-locate the cover fixing screw a little lower, towards the edge of the chassis and replace the cover.

## AMPLIFIER

Build up the circuit except for R2, R6 and R7 and connect to dip meter; turn power on, set sensitivity at minimum and R4 to mid range. Select R2 so that Q1  $V_c = 1/3$  to  $2/3$  of  $V_b$ . Make R6 the same as R2 and select R7 so that Q2  $V_c$  is very close to that of Q1. Now connect a multimeter to bridge (on a suitable low volts range). Zero the meter and increase dip meter sensitivity for a convenient reading. The device is now ready for use. To use the DM-800 as a wave meter, disconnect the amplifier plugs.

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**K. BRUCESMITH**  
110 Rosemead Road  
Hornsby N.S.W. 2077

# LISTENING AROUND



Joe Baker VK2BJX  
Box 2121, Mildura, Vic 3500

By a perusal of the VK2 section of the 1982/83 call book, I am more than convinced that Uncle Sam must have packed his flag in his bag and hi-tailed it for VK2. Look through other sections of the call book and you won't find as many VK2 American amateurs as there appear to be in NSW. A study of the addresses in this section of the call book is very interesting indeed. NSW appears to have a larger population of Americans with VK2 calls than the other states.

The "rough" for this article was being prepared just after the massive bushfires in Victoria and South Australia, and tributes to the work of amateurs who helped out are still being heard. The other night, VK2PBX John of Sunbury — a very good friend of mine from CB days — told me of a tribute to WICEN paid by Paul Welsh of the Victorian State Emergency Service.

When I heard that the fires had come within visual distance of Sunbury and not finding John on the air, I phoned his home to ensure that all was well. John later thanked me for doing this, but it was the least that I could do and the sort of thing that any other person would do.

Just before speaking with John on air on 1.3.83 I happened to come across the Tasmanian Devil Net conducted by Don, VK7NBF. What attracted me to pause on their frequency as I panned across the 80 m band was the very obvious interference to this net that was being done deliberately by some irresponsible person. A transmitter was being deliberately overmodulated to the point of distortion while the Tasmanian Devils were doing their best to ignore the disrupter as they conducted a contest. When VK3PBX and I later came up on a nearby frequency the disrupter jammed us to the extent that we were eventually forced to close down. While we could hear him, despite the heavily distorted transmitter, the disrupter, who used no call sign, was boasting of the fact that he had been able to force others to close down also. Although I know we are supposed to try and ignore such idiots, my feelings got the better of me at one stage and I told him he ought to go.

Word has reached me that one amateur radio operator (mobile) who volunteered to go to an area where many of the survivors of the bushfire were assembled for safety on a football oval, was prevented from doing so by some over-zealous civic authorities.

This was at a point in time when existing telephone lines were overloaded. He said

that had he been permitted to get to this area with his equipment he could have relieved some of the trauma of that time by passing traffic for people who wanted to contact relatives. He was bitterly disappointed at being prevented from rendering this service and said that some of these officials ought to be educated in the very useful work that even one amateur can do.

During the emergency, ABC radio 3LO remained on the air all one night and for a while maintained a talk-back programme during which I heard some caller named Anne ask for any information about "Digger Smith of Narungal who is believed to be a radio amateur". Digger is indeed a radio amateur to whom I have spoken often but I had no news of him at this time so I did not ring the number given by Anne. However, the following night I mentioned this to all on the Cocktail net, and I understand that a member of this net was able to ring Anne and supply the information re Digger. During this time also, Radio 3AW Melbourne did a wonderful job of bringing us up-to-the-minute reports of the fires from their on-the-spot reporters. At the time of writing, I know of at least four amateurs who lost much gear during the bushfires.

A South Australian amateur tried in vain to get a message through by phone to his son in Perth to let him know that Dad was OK. On air, he finally got through to a VK6 who offered to relay the reassuring message on by phone.

Although I was far from the disaster area of the Ash Wednesday fires, I know what bushfires are all about. About seven or eight years ago the whole of the western half of New South Wales was on fire and there were many fires raging on both sides of the Murray River in this Sunraysia area. To assist local volunteer and professional brigades, many appliances with their complete crews journeyed from as far away as Sydney, and thus it was not uncommon during that terrible fortnight, to see fire engines bearing the names of many Sydney suburbs cruising this area. At one point in time there were about sixteen or seventeen separate fires burning simultaneously and there was strong suspicion that some were deliberately lit.

This was long before I got my amateur ticket and before the CB craze hit this area, which means that I couldn't assist in the vital matter of communications. And although much valuable communications equipment was being used by fire officials, it was found that much of the gear could

not be used on a common frequency. I am told that the situation re message-passing was more than chaotic and the need for standardisation of nets was patently obvious. Nevertheless local people appreciated the valuable work done by the hundreds of volunteers who travelled 700 miles to assist us during that unforgettable period. Helicopters, operating out of Buronga Public school yard were used for fire spotting, and my receiver on the spot in the schoolyard enabled police and other authorities to hear messages direct, saving time before they arrived by other means.

So much for bushfires. What a land of contrasts we live in. I happened to be writing the original draft for this article on a day when the much needed rain seems to have arrived. To the west, the sky became darkened with a mixture of water vapor and Mallee dust, then was joined by thunder and lightning as all hell was let loose. A local radio station went off the air for about twenty five minutes, then returned with the announcer apologising for the blackout and bleating about his total inability to give the time, because with everything powered from the AC mains, the studio clocks had stopped also, and even the telephones were out of action.

I wonder is it a reflection of the times that we are so heavily dependent on the seemingly inexhaustible AC mains supply, and not even a commercial radio station has thought of using a battery operated kitchen clock, or one of the old fashioned wind-up variety. And as to why nobody was using a back-up power supply I can't even guess.

A few weeks ago, when there was a similar major disruption to the power supply the cry went out for everyone to stop watering their gardens with hand held hoses, as we were told by the radio that due to the interruption to the power supply, the pumps to the big city tank had ceased to function, and there was only one hour's water left in the tank. Now, why has not somebody thought of having auxiliary generators to power the water pumps? I wonder what will happen if World War Three gets going? I reckon that with our total dependence on generators located hundreds of miles away — with all that wire strung across the country, it will be child's play for the enemy to dislocate our big centres of population.



# WORLD COMMUNICATIONS YEAR

## Public Relations

John Hill, VK3DKK,  
PR CO-ORDINATOR

17 MAY 1983

### WORLD TELECOMMUNICATION DAY

One World One Network

"One world, one network" is the theme for the 15th World Communication Day, which — following a long standing practice — will take place on the 17th May, the anniversary of the founding of the oldest intergovernmental organisation in the United Nations System, the International Telecommunication Union (ITU) 118 years ago in Paris on the 17th May 1865. In his message, Mr R E Butler, the Secretary-General of the ITU, stresses that the development of the infrastructures is essential for the harmonious operation of the world network.

World Communication Day 1983 is of particular significance in that it falls within World Communications Year, proclaimed by the General Assembly, with the purpose of promoting the development of communications infrastructures throughout the world.

### WCY STAMPS

To celebrate World Communications Year, Australia Post will issue a 27 cent commemorative stamp on 16th May 1983. A First Day Cover will be issued around the same time.

### AX PREFIX

Word has been received from the Department of Communications that approval is given to the WIA to employ one station per division using the AX prefix and ITU suffix on the 17th May 1983 on the occasion of the World Telecommunication Day Contest.

No objection is seen to the use of the AX prefix by all amateur stations on this day.

### A WEEKEND WITH OE AND DL's

A "World Communication Tour" was organised by a number of German and Austrian Amateurs with wives and friends. The countries visited were Australia and New Zealand. After having visited ZL and VK2 the group flew to Melbourne where Walter VK3DFO acted as host during their stay over the weekend 26/27 March.

Highlights of the Melbourne stopover were a visit to the Science Museum, attending the WIA Broadcast, walk through the Botanical Gardens and a ride on the



Hans OE2UE, John VK3DKK and Ruprecht DF3CZ during WIA Broadcast.



L to R: Walter VK3DFO, Hans OE2UE, Ruprecht DF3CZ and Franz DJ9EO, ready to board "Puffing Billy"



Peter VK3AVE and Fred VK3BOU during WIA broadcast.



Ruprecht DF3CZ and Heinz DL6RB (standing) at VK3 radiorooms.

famous "Puffing Billy". Peter VK3AVE and Fred VK3BOU welcomed the guests at the "studio", whilst Walter VK3DFO and his wife Maria contributed with a barbecue at their home, attended by many VK friends. The visitors were Ruprecht DF3CZ (tour leader), Hans OE2UE, Franz DJ9EO and Heinz DL6RB.

### VK2 WCY PR

VK2 Federal Councillor, Stephen Pall VK2PS and Athol Tilley VK2BAD, Secretary of the WIA New South Wales Division, were the guest speakers at the Monday 28th February, 1983 meeting of the Rotary Club of Fairfield, NSW, Rotary District 969.

Before a well attended meeting Stephen introduced the concept of amateur radio, its meaning and standing in the community. It traced its history from the turn of the century to present day and practical information was given of what to do to become a radio amateur. Old copies of "Amateur Radio" and copies of the WIA pamphlet "A-Z" were distributed. A video tape presentation about "Amateur Radio", using copies of the federal video library, was made by Athol.

At the end of the Rotary meeting a practical demonstration how amateur radio works was made, using a hand held two metre set working via the Dural repeater, and a QSO with a NZ amateur (ZL2MBC) was conducted on twenty metres with the help of Stephen's rig which was, at the meeting, set up as an amateur station. An ended random wire antenna was tuned with an AT unit.

from Stephen Pall VK2PS

AR

### ADDRESS UNKNOWN



Would Blake Taylor of Lynwood WA please contact Amateur Radio and let the Editor know your current address.

Australia Post have returned a letter as address unknown.

The address for AR is PO Box 300, Caulfield South, Vic, 3162.

AR



# HOW'S DX

Ken McLachlan VK3AH,  
PO Box 39 Mooroolbark Vic. 3138.

April Fools Day is the day when you are wary of what you hear but Bouvet was the area the DXers concentrated on this year. The world amateurs had the opportunity and the dubious "honour" of working the station 3Y1A who claimed to be on the island. This station was very explicit in his QSL arrangements, that all cards go to LA3DA. What a busy time his postman is going to have and Nils is going to have to do a lot of explaining to the multitudes if this station was not genuine.

Still on Bouvet, still 1st April, was the rumour that this much wanted and inaccessible outcrop would be activated in late 1983 or early 1984 by an Australian expedition. The only known activity that is planned is a Scientific Expedition from LA in 1984/85.

## 1983 CQ WW WPX CONTEST

The 1983 CQ WW WPX Contest, commenced as a disaster in VK3, with the bands misbehaving to the extent that very few QSO's of any note were made on the first day of the contest. Anticipated large ruled up log sheets will have to wait to be filled maybe next year.

When the band did eventually open, on twenty metres, the European QRM built up to the impossible and the easiest way to gain points was to turn the beam north and work the well disciplined operators in Asia. It was a pleasure to call one station and for that station to come back and give a report. This was consistent for the whole time the band was open to the north.

The VK novice had little show of making a reasonable number of contacts as both ten and fifteen metres were not kind and hardly opened at all. If there was much action it was generally outside the segment of the novice allocation. A number of amateurs still flaunt the "gentlemen's" agreement and selfishly operate on SSB under 21.150 MHz, in a narrow segment, that novice operators have to increase their CW prowess. These surreptitious operations are equally carried out by amateurs holding limited and unlimited privileges.

Many exotic prefixes were heard and worked, including XFOMDX on Revilla Gigedo who, when last heard, had in excess of 2900 contacts to their credit. Closer to home, Bob ZK1CG, was doing excellent business and towards the end of the contest sounded that some throat jubes would be of great assistance.

Perhaps propagation next year may be better and allow more VK participation in this, my favourite overseas contest.

## FRANZ JOSEF LAND

Chris VK3OG, had the pleasure of working UK1PGO recently and reports that this station has had very few VK's in the log over the last few months. The operators of this still rare country do have scheds on Mondays at 1300 UTC on 14.150 MHz.

## HOLIDAY DXING

Jan and Jay, K6HHD/FO0OJ and W6GO/FO0JO, took a break from the chores of producing their QSL Manager List, which is a must for any serious DXer, and ventured to French Polynesia for a mini DXpedition which was sponsored by the International DX Foundation. It was coincidental that such a trip would enable them to partake in the CQ WW DX Phone Contest.



Jan FO0OJ operating.

The breakdown of 8915 QSO's during the period of 22 October to 4 November, 1982 shows that 128 different countries were worked by both operators with VK getting 3% of the action and ZL and VE 2% each. The operators in the USA fared well with 58% followed by JA with 26%. Europeans gained a 1% success rate.



Jay FO0JO at "work".

The breakdown of the QSO's per band given by the happy twosome is as follows:

3.5	7	14	21	28 MHz
5	7	20	24	44%

Jan writes that 2285 cards are now in the mail and the sample supplied would rate it as one of the nicest multi coloured cards that has been seen at this QTH in many years.



The Residence at Moorea.

## TWO HUNDRED PLUS

Diana G4EZI, by working PY0ZSF, notched up LY country 205. Considering the difficulty in finding that elusive DX country is a big enough challenge, yet alone to achieve 205 LY countries since being licensed. What's the secret, Diana?

## MOZAMBIQUE

Jane ON7WW, writes to say that conditions have not been very good and short skip ORM has not been conducive to good DX QSO's. Jane also mentions that Jack ON6BC/C9 is back home and was unable to obtain the correct documentation to satisfy the ARRL scrutineers. Quite a pity as this is a much needed country.

## UNUSUAL PREFIX

Selected Yugoslavian amateurs are using their alternative 4N and 40 prefix allocation for the 1984 Winter Olympics to be held in Sarajevo. It has been intimated that quite a few calls will be on the bands over the next twelve months from this country. The operators from Sarajevo will see a lot of Willy, in green and gold, a creative koala, the first official mascot ever to represent Australia in an Olympiad.

## WARC BANDS

The latest known "stocktake" of countries that have been granted the WARC bands lists the following.

10 MHz has been granted to A2, A3, DL, DU, EA, F, G, H4, HB, J2, JA, LA, LX, OA, OY, OZ, P2, PA, PJ, PZ, VE, VK, W, XE, YB, YK, ZF, ZL, ZS, 4X, 5N, 7X, 9H, 9L and 9M.

18 and 24 MHz activity is now allowed from A2, A3, A4, DL, F, G, HB, J2, LA, OA, OY, OZ, PA, VK, YB, ZF, ZS, 4X, 5N, 7X and 9L.

Quite an impressive list for the SWLer and the dedicated amateur to look for.

Though not acceptable for DXCC, they should create quite a lot of interest.

#### JY ACTIVITY

The "globetrotting" Colvins, after making quite an impact from 9K2 on the waiting multitudes, moved on as predicted to JY. Iris was giving many a new YL country when she was signing as JY8KG and operating from JY3ZH's QTH. The deliberate QRM everyone could have done without but Zedan's transmitters have a way of getting out from that QTH overlooking Amman. QSL's are assured from YASME.

#### MALAGASY REPUBLIC

Paul, F6EXV now signing TO6EXV, a special prefix to commemorate WCY, has had to cancel his arrangements to visit Alain 5R8AL and assist him in some serious operating from the rather "unheard-of-on-the-bands" QTH. One reason that Paul put forth was that he has been conscripted into military training for a period and this was going to alter his operating habits.

In the meantime Alain 5R8AL can be heard occasionally on the low end of the twenty metre phone segment speaking to his friends back home.

#### BANGLADESH

Peter S2BTF, is active from this rare area on SSB. In a brief QSO with Peter he indicated that he would be QRV until mid July. QSL's, if you are lucky enough to catch him on SEA Net on 14.320 MHz at 1200 UTC, should go to LA5NM.

Two JA operators hoped to assist in taking S2 off the rarity list as a gesture for WCY in late March and early April. This period was to take in the WPX contest of course.

#### 1Z9A

Will it or won't it is the question? The answer is not known but it is another attempt to get recognition of the operators from the State of Kawthoolei who have formerly operated under the "prefix" XZ9.

One wonders if this "allocation" is genuine or the results of someone's dream. Is it another ploy to be accepted by the ARRL and consequently increase the diminishing flow of ICR's and "greenbacks" in to the "kitty"? Recommend that you work it as I have done and sit back and wait for a decision as to its acceptance by the ARRL committee.

#### COCOS KEELING

Paul VK9YB, had a lengthy stopover on the island recently and was set to outdo Neil's VK9YE QSO rate in his Mini "DXpedition" last year. Paul's QSL arrangements are via VK5QX.

#### TOGO REPUBLIC

Ted 5V7HL, is to be shortly joined by another missionary who will become active on the bands. Ted has given many a DXer this rare country in the limited operating time that he has available. Ted has never appointed a manager mainly due to the fact that he says that he doesn't have the time to operate and swell the log book that would justify one's existence.

#### DAYTON

Ian VK5QX, reports that VK5CCT/VK9YA will be definitely attending the Dayton convention this year. Many amateurs have made their intention known of attending this world renowned convention over the past few months but Alec is the first definite starter that is known at the present.

#### BEACONS

A group of interested North American amateurs have funded a chain of eight beacons which will operate sequentially on 14.100 MHz. The beacons are as follows:

TIME	CALLSIGN	LOCATION
**00	4U1UN/B	New York
**01	K60BO/B	Stanford, CA
**02	KH60/B	Honolulu, HI
**03	J421GY	Tokyo
**04	4X4TU/B	Tel Aviv
**05	OH2B	Espo
**06	CT3B	Madeira
**07	ZS6DN/B	Transvaal

Each beacon transmits in sequence for one minute every ten minutes. The message sequence is as follows: (100W) "QST de (callsign) beacon", (100W) nine second dash, (10W) nine second dash, (1W) nine second dash, (0.1W) nine second dash, (100W) "SK (callsign)". All beacons should now be operational using single element quad loops for antennae.

#### MODEL STATION

The ultimate in operational comfort is what all amateurs strive to achieve. Glyn VK3VQX, has constructed this magnificent station, which has all "mod cons" at one's fingertips, for ease of operation. Glyn is fairly new to the bands and one must think that it will not be long before that back wall is filled with overseas certificates.



Glyn VK3VQX's operating console.

#### ARRL MICROSCOPE

Erik SMAQGD/KH1 and T31AE was a little slow in submitting verification of his successful visit to this area. In fact some of the cards that were sent out were on the DXCC desk for updating amateurs' standings before the paper work was received from Sweden. The result, returned cards with no credit. This anomaly was soon rectified and all cards from this area are now acceptable.

#### RECIPROCAL LICENCE

It is believed that the negotiations between G and JA are closer to a reciprocal agreement. A number of 9V and VS amateurs are dwelling on such an agreement which would allow them a licence whilst on holidays in this area.

#### CW SWL-ING WITH ERIC L30042

##### 28MHz

FK8DZ, JA, 8J5UN, UA0CBE, UA0LFI, UI80AA, VESRA, WE6WQ, VE7UZ, X07CC, X07SR, VK8HA, KAEAS, W7WHD.

##### 21MHz

BY1PK (0715UTC), DU1CK, FK8CE, FKBKA/I.P., HL4VM, ISONZA, JT1AO, OK1APJ, UA0SAB, UR2RK5, VK8HA, 9M6YY.

##### 14MHz

A35XX, CE3AA, CM8JC, CR9T, NO2DZ/DU2, FG7CC, FK8BU, FMOAX, F08DR, F08V, HK0BKX, JD1A8Z, KP4V, KH60/B (Beacon), OK3OM, W2B8K/P/JT, PY1ZAE, KDL11/T2, T30AT, SV1NY, UL7FCG 4K1A, VK9YB, VP5SSX, VP9DR, X07CC, WB6WX/B (Beacon), Y44U, ZK1AA, ZK2WB, ZL3TZ/C, OK0GDA/ZL5, 4S7EC, Y5HNN, 9V1TL.

##### 10MHz

A35MS, DL8MM, EA1BSU, F3NB, G2BY, HB8BE, JA, KV4CI, OZ2RH, PA3BTH, VK8OB, W9UZL, ZL1BWX.

##### 7MHz

EW2A, F9XL, FC9VN, FK8DZ, G3LNS, FM7BZ, HL5BBM, IT970H, JA, HB9G, HL5KT, 13LJIE/KP4, L21KAB, X07CC, VK9YC, VP9JR, VS6DO, VU2TTC, Y03AWC, 4N9QLY.

##### 3.5MHz

YU2DAM/M.

#### QSL MANAGERS

3A3LT (3A2ARM), 4K1G (UA0UCV), 4K1H (UA1CJD), 4Y9VU (YU4FRS), 5N7HRR (OK5RI), 6Y5MM (K8Z2B), 7W8CG (KCF0H), 9U5SDS (W4AWPO), A22CT (G3HCT), A22DC (4K4JF), C13ZL (G4HYO), CE9AT (WB6WOD), C02HQ (WB6QPG), C02PY (K87SB), C01CAK (CT1CAK), CR8BK (JA1HGY), EK9D/0 (UK9CAA), EL2AD (WA3AHP), EW2A (UK2AAB), F6FGW/5V7 (F6FGW), F7BL/FC (4B4FY), FK8CR (F6EWK), GUSCIA (N6MA), HB0BHA (DK6NN), HK0BVKX (WB4QFH), J20BL (F6BN), J20DU (WB6GG), J28DP (F26A), JD1FHL (JM1FHL), VP2MKD (N0DH), VU2JXO (WA3TLB), VU2TLB (WA3TLB), ZD7WT (ZD8TM), ZP5PX (W3HNK).

#### THANKS

These notes have been made possible by information from such magazines as *CoDX*, *WORLD RADIO RADCOM*, *CO*, *OST*, *HOW'S DX*, *DX NEWS*, *QTC*, *BREAK IN* and amateurs including *DK2OZ*, *DK9PC*, *G3NBC*, *IBSAT*, *K6HH*, *ON7WW* and *VK's 1MM*, *2PS*, *3BY*, *FR*, *UX*, *YJ*, *YL*, *DHF*, *VQX*, *4YX*, *5OX*, *6FS*, *HD*, *IH*, *NE* and *Eric L30042*. Sincere thanks to one and all.

**JOIN A NEW  
MEMBER  
NOW**

# WICEN NEWS

Ron Henderson VK1RH  
FEDERAL WICEN CO-ORDINATOR  
171 Kingsford Smith Drive, Melba, ACT 2615



## COUNTER DISASTER COMMUNICATIONS STUDY

WICEN has received an invitation to be represented at a Counter Disaster Communications Study jointly sponsored by Department of Communications and Natural Disasters Organisation, to be held at the Australian Counter Disaster College, Mt Macedon from 24 to 27 July, 1983. With the concurrence of the Federal Executive, I, as Federal WICEN Co-ordinator, have been nominated to attend.

A suitable scenario, which includes bush fires and cyclones, has been proposed as a basis of the study and representation has been invited from a wide range of Commonwealth Departments, State Emergency Services, TV and Broadcasting Federations and the Royal Flying Doctor Service.

The scope of the Study will include:

- (a) The extent of the Australian disaster problem.
- (b) The general requirements for effective response to disaster, with particular reference to communications.
- (c) Briefings on current and planned future Australian communications capability in relation to the requirements for effective response to disaster.
- (d) Identification of communications requirements for effective response to disasters with particular reference to Australian (including external territory) circumstances.
- (e) Review of Australia's communications capability in relation to the identified requirements.
- (f) Suggestions for the improvement of Australia's capability
  - in the immediate short term; and
  - in the long term.
- (g) Identification of training needs.

I will be contacting state co-ordinators separately but if there is anything you personally would wish me to be aware of please write to me at the above address. Now is the time to debrief and review the activities of the recent summer.

## QUEENSLAND WICEN QUESTIONNAIRE

I am indebted to Ken Ayers, VK4KD, the Queensland WICEN co-ordinator for the following questionnaire which is reproduced as received. This is part of Ken's dynamic approach to WICEN awareness and passage of information within his division. Keep up the good work Ken!

## HOW DO YOU RATE AS A QUEENSLAND WICEN OFFICER? ANSWER TRUTHFULLY AND CHECK YOUR SCORE

### QUESTION

### TICK YOUR SCORE

- 1) Do most of the local amateurs know you are a WICEN Officer? (10) YES  
(0) NO
- 2) Have you given a talk at your local radio club on WICEN? (10) YES  
(0) NO
- 3) Have you organised a local WICEN net in your area? (10) YES  
(0) NO
- 4) Are you registered with the local SES as a member? (5) YES  
(0) NO
- 5) Do you know the name of your local SES Group Leader? (10) YES  
(0) NO
- 6) Do you know the name of the SES area Controller. (5) YES  
(0) NO
- 7) In an emergency with no telephone, could you get a message to your local SES headquarters within five minutes? (10) YES  
(0) NO
- 8) Do you check into the weekly 7050 state network? (10) ALWAYS  
(5) SOMETIMES  
(2) RARELY  
(0) NO
- 9) Can you recite the PHONETIC ALPHABETIC accurately? (10) YES  
(5) MOSTLY  
(0) NO
- 10) Are you familiar with the WICEN PROWORDS? (10) YES  
(5) MOSTLY  
(0) NO
- 11) Do you know how to give or take a map reference? (5) YES  
(0) NO
- 12) Have you emergency power and can get on air without mains? (10) YES  
(5) NO
- 13) In an emergency, after family and immediate house damage assessment, would you go on air immediately to help other WICEN stations and the authorities? (10) YES  
(0) PROBABLY
- 14) Have you a telephone? (5) YES  
(0) NO
- 15) Are you emergency minded and a survivalist? (5) YES  
(0) NO
- 16) Could you erect an emergency antenna within half an hour? (5) YES  
(0) NO
- 17) Have you a fully stocked first aid kit? (5) YES  
(0) NO
- 18) Have you a survival kit or emergency rations available? (5) YES  
(0) NO
- 19) Have you a fire extinguisher in the house or car? (10) YES  
(0) NO

**SCORING:** 120 to 150 — You are a good amateur dedicated to WICEN.  
80 to 120 — You are a good WICEN Officer but you should seriously consider the answers where you didn't get top marks.  
25 to 80 — You are not taking your important job as WICEN Officer seriously enough.  
Under 25 — Please resign, you are letting the team down.



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#### HAL:

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# INTRUDER WATCH



This month, we continue with a short list of known intruders using the A1A (CW) and F1B (RTTY) modes of emission. The A1A intruders can be difficult to monitor, as often the sending speed is very fast, and they don't identify as frequently as we would like. Often, also, they are listening on other frequencies, so we don't hear any replies, and don't always know the identity of the station they are working.

## FREQUENCY: CALL-SIGN:

7012	HY6J
7013	LNV
7060	SGJ
14015	6VVG
14040	MS2T
	XBMC
14079	VRQ, VHL
14141	ULY4, UIJ2, UWX2
14198	7HKM, PAA, AF
14199	QRBS
14244	OSA
21032	UMS (USSR Naval)
21115	F9T (Diplomatic)

Intruder reports on these, and any other intruders are sought by the Intruder Watch.

For the statistically-minded, here are a few facts on the Intruder Watch from June to December, 1982.

Number of intruders reported: 1705

Number of intruders using RTTY: 439

Number of intruders using AM: 405

Number of intruders using CW: 48

Number of intruders who identified: 222

And finally, thanks to the following amateurs who sent in reports of intruders in this period:

VK1 MM NEB DC GD NBS NET UE JO.

VK2 DAT PS VYI BQS QL NSR PEJ ARR AZR

VK3 LC XB AMD DMP DBB

VK4 BG VFG AFA KAL AKX FB YX

VK5 RM

Now that intruders using the A3E (AM) (see March issue), and A1A (CW) modes have been discussed, let us turn our attention to those intruders who employ the F1B (RTTY) mode of transmission. This is the most prevalent mode employed by intruders, and can be heard virtually at any time on the amateur bands. Bear in mind that amateur operators NEED NO LONGER IDENTIFY IN CW OR PHONE if they are transmitting RTTY signals. They can now identify only in the mode of transmission, if they wish, and this makes the task of separating intruders from amateurs using RTTY more difficult.

If you have RTTY capabilities, well and good. If not, at least you can still measure the shift of the transmission, and any shift over 850 Hz IS DEFINITELY AN INTRUDER. Amateurs can use shifts only upon to

850 Hz. Intruders use shifts of 170, 250, 425, 500, 850, 1000, 2000 Hz, etc, and this makes things difficult. If you hear a RTTY transmission you suspect as being that of an intruder, measure his shift by first zero-beating the mark frequency, and then the space frequency. The difference is the shift, and the point midway between the two is the frequency of transmission. If your rig has a digital read-out, this is comparatively easy.

If the mark frequency zero-beats on a frequency 1000 Hz away from the zero-beat of the space frequency, then the shift is 1000 Hz, and if the two frequencies in question are, say, 14.141, and 14.140, then the frequency of transmission is 14.140.5 MHz.

Now to the more common intruders using RTTY:

Frequency	Station	Details
7.048	UHR3	USSR
14.025	HML61, HMR56, KCNA (Korean Central HME28, HMM32, News Agency)	
	HMH28, HKM21, Find more on 21.056 MHz	
	HMK25.	
14.071	VNA	Vietnam News Agency. Also on 21.199
14.101	BXT1	China
	BXT43	China
14.115	YSK	East Germany. Also 14.145, 14.163 MHz
14.131	Z3N	Thought to be Diplomatic
14.141	UMS	USSR Naval station
14.154	BXT21	China
14.218	QLK	Uses FSK Morse
14.248	BXT17	China
21.032	UMS	USSR Naval station

The above details will give you some idea of the abundance of intruders to be found on our bands. But what happens to the intruders who slip up? *Read on...*

To circumvent the International Telecommunications network, and to ensure industrial secrecy, a Sydney-based company recently got up to some funny business on the HF bands. They were using a VK2 call-sign, and working to the Pacific Islands to an H44 call-sign (neither of which, of course, were amateur operators), using two FT 707s. Power in use was 1.5 KW, and antennas were two log-periodics. Amplifiers were in use, of course. This company was working on the 40, 20, 15, and 10 metre amateur bands, as well as other frequencies. Modes were RTTY, using unusual shifts and speeds, and SSB. Unfortunately for them, they out-smarted themselves, and had \$15,000 worth of equipment seized; had their antennae dismantled, and of course, charges were laid under the Wireless Telegraphy Act. Also found on the premises were three unauthorised UHF rigs.

Bill Martin, VK2EBM,  
FEDERAL INTRUDER WATCH  
CO-ORDINATOR  
33 Somerville Rd, Hornsby Heights, NSW, 2077.

I have no sympathy for these type of offenders, and the sooner we can report more results like this with regard to other Commercial, Governmental or Military Intruders, the better.

You can help by telling us what you hear. Send any Intruder reports to your Divisional Intruder Watch Co-ordinator, whose details can be found by contacting your Divisional Office. See you next month.

AR

## WHO IS THIS AMATEUR?

Peter Brown VK4PJ  
16 Bede Street, Balmoral, Qld 4171

He was born in Sydney in 1872 and passed on in 1928. It is doubtful that he had an amateur radio licence. He commenced his working life apprenticed to an architect but mastered many other callings ranging from engineering to art and writing.

He formed the "Association for Developing Wireless in Australia, New Zealand and Fiji" and was Honorary Secretary. The formation of the Wireless Institute of Australia was credited to him along with many other organisations of note.

He was honoured by the Royal Geographic Society, Royal Astronomical Society and Institution of Engineers, Australia.

In 1911 he established wireless communication between interstate express trains, directed a model and fired a gun by radio. A Memorial Lectureship in Aeronautics was established at Sydney University to recognise his efforts in Aviation, Wireless and Building Construction. This man built and flew gliders in 1909.

His life work is best described in a biography by J M Giles published in a supplement to "Construction" 11/12/1957, and some mention is made of him in WIA Book 1.

On Wednesday 27th October, 1925, he addressed a meeting of the WIA Queensland Division on "Wireless — Today and Tomorrow", and correctly predicted the form that present day television would take. "He has a great reputation for good work: the best of that reputation having been won for services rendered to others". Yes he was George Augustine Taylor. Who has his photograph?

AR



# POUNDING BRASS

Marshall Emm VK5FN  
GPO Box 389, Adelaide, SA 5001

## SIGNAL REPORTING

*One of the oldest traditions of amateur radio, and the subject of an incredible amount of controversy, is the Signal Report. It is important to all of us to know how "good" a signal we are putting out, yet in the first place a signal report is merely someone's opinion and, secondly, there is seldom anything we can do about a "bad" report. At best a report gives us some idea of "how we are getting out"; at worst it can make us suspect problems which have absolutely nothing to do with our own equipment. Of course reports are VERY useful during contests, when the organizers have said that signal reports WILL be exchanged.*

The basic problem is that a signal report is determined by an operator's ability to hear the signal, and his ability is determined by the quality of his receiver and antenna, the state of his hearing, and his understanding of the business, among other factors INCLUDING the sort of signal you are transmitting and how well it has propagated to the listener's part of the world. All you can reasonably expect is a report of how it sounds to him, in comparison with other signals on the band or which he has evaluated in the past. He may make use of an S-meter, which makes him reliant on the equipment manufacturer's opinion as well as his own.

Given that the whole business is pretty unscientific, we owe it to our fellow amateurs to give as accurate an assessment as possible in accordance with the standard reporting system.

In the case of CW, the standard report format is called the "RST Report", which consists of a three digit number representing an appraisal of Readability (R), Strength (S), and Tone (T), in that order.

**READABILITY.** Reported on a scale of 1 to 5, where 1 represents no readability and 5 equals perfect copy. Assuming that "copy" is our ability to derive intelligence from a received signal, perfect copy would represent 100% reception with no difficulty. For the record, the scale is:

- R1 No readability
- R2 Barely readable (only occasional words)
- R3 Readable with difficulty
- R4 Readable with practically no difficulty
- R5 Perfectly readable.

The word "difficulty" as used above

presents some problems. Keeping in mind that we are talking about actual signals here, you should ignore "difficulty" that you might experience due to your own copying ability or the other station's sending speed.

Note that there is no provision for a report of Readability 0 — R1 means no readability, and you can't get any lower than none!

**STRENGTH.** Reported on a scale of 1 to 9, where 1 represents faint signals and 9 represents extremely strong ones:

S1 Faint, barely perceptible	S6 Good
S2 Very weak	S7 Moderately strong
S3 Weak	S8 Strong
S4 Fair	S9 Extremely strong
S5 Fairly good	strong

A great degree of judgement is called for in giving a strength report. "S-points" cannot be measured objectively outside a laboratory, so meter deflection should be taken as a relative indication only. For example, my own S-meter rarely moves at all on 10 metres — if it twitches the received signal must be at least 8! As far as possible, give a report which indicates the strength relative to other signals on the band. It may seem strange to give an S9 report when the static noise level is S9 + 3 dB, but there is scope in the report amplifications to explain that one, as we shall see next month.

**Never, never, never give a report of S0. It just makes you look silly, because if there is no signal strength at all, there is no signal — and nothing for you to report on in the first place.**

For practical purposes, readability can give a clue to the appropriate strength report, at least to this extent — if readability

is 5, Strength can't be less than 3. Look at the tables again and think about it.

**TONE.** Yes, tone . . . Well, what can we say about tone? This report must go back to the days of spark. T1 is defined as a rough, hissing note, while T9 is defined as a pure DC note with no trace of ripple. I think in technical terms a report of less than T9 would have to represent some form of modulation, but I'm damned if I've ever heard it.

**Note: Technical faults such as Chirp, Drift and Clicks do not mean sub-standard tone. They will be covered separately next month.**

I once got a report of 5/9/8 and I was so shocked I nearly broke the paddles going back with "T9 T8? WHY T8?" The answer I got was "SRI OM RCRV HR NOT VY GUD". He knew the fault was in his receiver, but he still wouldn't change my report. Oh, well . . .

Ultimately the tone report will go the way of the dinosaurs. Good riddance, and perhaps we can speed it on its way. As an experiment, once this has appeared in print and I can hope for some support, I will stop giving tone reports and just give readability and strength, with any amplification which might be called for (X, C, D, K, QRM, QRN). If anybody demands a tone report, I'll go back with "T9 OF COURSE OM T9". Well you have to start somewhere, so wish me luck and why not try it yourself? Who knows, maybe we can start something worthwhile in this staid old hobby of ours. If you agree with the idea, why not drop us a line, direct or via the editor, and of course if you know of a good reason for keeping the T report, I'd sure love to hear it!

Till next month, keep pounding ES 73.

AM



RTTY picture courtesy Les White VK5ZW.

However I certainly do not recommend that you attempt this and I only mention it to underline that the mechanical generation of RTTY is as simple as the opening and closing of a circuit according to the RTTY code. The normal amateur RTTY sending speed is 45.45 Bauds and at this 60 WPM speed the shortest part of a RTTY signal is 22 milliseconds (just a little shorter than a 60 WPM Morse dot). In a RTTY signal there are seven parts the total length of the 45.45 Baud. The RTTY signal is 163 milliseconds. The first six parts are all 22 milliseconds each and the last part 31 milliseconds long. The first part is always space or off and the last part always mark or on.

To generate a RTTY signal we need a rapid system of on/off switching that gives accurate time lengths of on and off as needed for the various letters etc. The five coded parts of the signal are changeable and the start and stop parts of the signal are always the same. By the way these parts are called bits in computer jargon.

The help explain what is involved in a simple way I will, as a teaching aid, describe a very simple mechanical system. RTTY sending can be done with a rotary switch having seven segments, the rotary arm being motor driven to do one revolution every 163 milliseconds.

At this stage please study the diagrams and continue to do this as necessary while you read the remainder of this explanation.

Six of the switch segments are arranged so the moving switch arm takes 22 milliseconds to sweep over each one in turn, the seventh one is slightly longer and the arm takes 31 milliseconds to pass over it.

The longer segment is the stop pulse segment and considering the direction of rotation the next one contacted by the arm is the start pulse contact. As the start pulse is always a space or open circuit condition nothing is connected to this segment of the switch and we will call it the S segment, the next segment is the first of the code segments so we will call it No. 1 the next No. 2 and so on up to code segment No. 5, the stop segment we will call F (F for finish).

There is little insulating space between segments and the switch arm is wide enough to bridge the insulation gap (make

## HERE'S RTTY!

Bruce Hannaford VK5XI  
57 Haydown Road, Elizabeth Grove, SA 5112

### MECHANICAL GENERATION OF RTTY SIGNALS

*If you were a very exceptional CW operator with the dexterity and sense of rhythm of a jazz band drummer and had learnt the RTTY code perfectly then you could send RTTY with a Morse key.*

before break). Segments 1 to 5 have a push button hold on switch in series with each one so according to what buttons are pressed the five code segments can be made either mark or space. Holding down a button will make that segment mark and all buttons not held down will make their segments space. The F segment is always a stop pulse (mark) so will always be connected needing no push button switch in series with it.

If the switch arm is rotating at the correct speed and the No. 1 push button is pressed while the arm is over the F or S segments and held down until the arm returns to the F segment and then released the letter E will be sent assuming the receiving equipment is in the letters printing condition. NOTE: In a teleprinter there are less typing keys than a typewriter and letters and figures are combined on the same keys so a special signal is sent to make the receiving machine print either letters or figures and the machine thus operated will stay that way until another signal is sent to change it back again. If the receiving machine was in the figures printing condition the figure 3 would have been sent. If the button is held down for several revs of the switch arm several E or 3s will be sent. If no push buttons are pressed the rotating arm will send start and stop pulses with five space signals for the coded positions, this combination of five spaces is normally not used to print anything and although it has a key on the teleprinter keyboard the key is blank as it prints nothing and normally does nothing at the receiving end.

Sometimes this signal is used to control something at the receiving end however its use is limited as it is an error prone signal because a break in the transmitting to receiving circuit also gives the same signal. As far as our simple sending device is concerned we can simply assume no buttons pressed mean nothing printed at the receiving end.

Now as mentioned before the changing of button positions should be done while the switch arm is over the F or S segments and never while the arm is over the coded segments portion of the switch. Failure to observe this will normally mean various unwanted character signals will be sent.

Because of the rapid rotation of the switch arm it is very difficult to press the buttons at the exact right time so it is desirable to have a one turn clutch that, when engaged, starts the switch arm revolving and stops it after one turn, also the start and stop positions are always at the same point, namely at the end of the stop segment.

With such a clutch in operation press the clutch starting key and you always get one turn even if you hold the key down long enough for several turns.

As an experiment I have made and tried this system on air and I can assure you it does indeed work, the main problem being to quickly remember the RTTY code and decide on the right buttons to press. I found it was best to have the five buttons one under each finger of the right hand and the print or start key under the first finger of the left hand. As the buttons are always there under the correct fingers there is no need to keep looking at your simple keyboard and instead you can watch what is printed, as it is printed. All very interesting, but I repeat I only recommend this system as a teaching experiment and not as a permanent RTTY sending device.

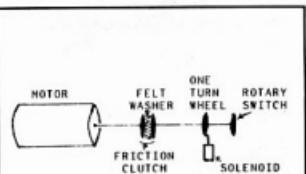
In a normal teleprinter machine you need not know the RTTY code as pressing the desired letter key etc automatically sets the code switches into the correct position and the pressing of any of the keys also sets the one turn clutch into operation at the same time. Additionally when the clutch engages, the switch setting mechanism is locked so a second key cannot be pressed until the first signal has finished.

In our simple sending device a single rotary switch was used but in normal teleprinters each of the five code switches are controlled by a separate cam mounted at different spots on the same shaft. As each cam portion is arranged to come into action consecutively the result is much the same except it is a more compact system that provides easier keyboard control of the switching mechanism.

Well so much for this simple explanation of the mechanical generation of RTTY signals. What has been explained should start beginners along the right road and

help when, for the first time, they are confronted with the complexity of a teleprinter service handbook.

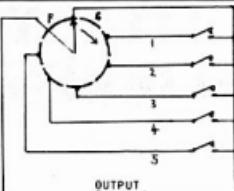
At a later date we will deal with the mechanical reception of RTTY signals.



#### RTTY SENDING DEVICE (45.45 Bauds)

The motor drives the rotary switch through a friction clutch, the driving shaft being broken at this point. 368 RPM — one turn per 163 milliseconds.

In the above diagram the one turn wheel that is attached to the rotary switch shaft has a single projecting tooth that comes to rest against the solenoid armature pin in its extended no current position. While in this condition the motor is turning and the clutch is slipping and the rotary switch is stationary at its stop position.



#### ROTARY SWITCH DETAILS

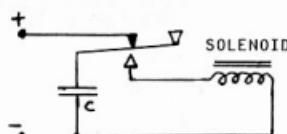
The switch is shown in its stop or at rest position near the end of the F segment. When rotated — F gives a mark and S gives a space 1 to 5 depending on which press button switches are closed.

When the solenoid is briefly energised its armature pin is withdrawn allowing the switch shaft to rotate for only one turn as the armature pin has returned to its at rest extended position before the tooth comes around again.

#### 1983 RD CONTEST

As RTTY participation in the 1982 contest was almost negligible I intend to do all I can to reverse this in 1983.

1. I am endeavouring to have the rules changed so telegraphy contacts receive double points.
2. I am asking the WIA to recommend what



#### SOLENOID ARRANGEMENT

Voltage supply is high enough to easily close the solenoid. C is just large enough to briefly operate the solenoid when key is pressed.

frequencies should be used by RTTY stations during the contest.

3. I am trying to organise some special RTTY awards for those with the highest RTTY contacts score.

4. I am compiling a list of RTTY stations that intend to participate on HF bands and will publicise this just before the contest.

All the above statements have a monotonous repetition of the word I and it should not be that way, how about YOU getting into the act and helping in this effort.

73 From Bruce VK1XI

AR

## EQUIPMENT REVIEW

### VoCom TELESCOPIC TWO METRE ANTENNA

Perhaps one of the best pieces of gear I've bought is my two metre "handheld". I'm onto my second one, synthesised of course, but it has the same limitations as the first — an inability to reliably raise two out of the three local repeaters.

Fortunately a solution was available from GFS, (an AR advertiser of course) — the VoCom telescopic antenna.

As the photograph shows the antenna telescopes down to almost the same size as the "rubber ducky". This is an advantage when you are moving about with the rig either in your hand or hanging from your belt and you want to monitor a channel or two. In this position the received signal is indistinguishable from the "rubber ducky".

When you want to reply to a call it is only a two second task to extend the antenna to its full 1.2 metre length. The effect is as adding a linear. Where once only a thin and noisy unreadable signal might have resulted on the "rubber ducky" the VoCom five-eighth gives a good strong, virtually noise free signal.

I have used this antenna in locations from mountain tops to motel rooms, around Australia and New Zealand with excellent results.

So much for the users report, now for the technical details.

Ron Cook VK3AFW  
7 Dallas Avenue, Oakleigh Vic 3166



Connector: BNC

Length: 210 mm telescoped

1215 mm extended

(Both lengths include the connector and loading coil)

Impedance: 50 ohms nominal

On test the VSWR was about 2:1 over most of the band, rising slightly at the low frequency end. Measurement of the length of the radiator revealed that it was about sixty four mm (2 1/2") shorter than the recommended length.

Comparative tests were made against a carefully resonated and matched half-wave. It could be expected that the half-wave may out perform the five-eighth wave when either were mounted on the hand-held without resonant radials. The small gain of the five-eighth over the half-wave might be expected to be more than lost due to the poor ground plane.

In practice there was a barely perceptible difference, in favour of the half-wave.

between either antenna on transmission or reception, a very satisfactory result.

Extending the radiator to the full five-eighth wavelength by adding length of thin brazing rod may improve the match to 50 ohms. I haven't bothered because the operational improvement would be slight and the telescoped length would be longer.

The appearance isn't very exciting. The finish is chrome and black and white plastic.

Nevertheless, when I sell the hand-held I'll be keeping the VoCom.

The VoCom five-eighth 2 m antenna is available from GFS Electronic Imports, PO Box 97, Mitcham, Vic 3132 for around \$35.

#### AT A GLANCE

PARAMETER	RATING
Size	****
Performance	****
Appearance	***
Construction	****
Matching	***

AR

# MODERN MILITARY SURPLUS EQUIPMENT



Colin MacKinnon, VK2DYM  
PO Box 21, Pennant Hills, NSW, 2120

## Reception Set R210

*The R210 is a seven band single superheterodyne communications receiver normally used in conjunction with the Wireless Sender C11. It can be used with longwire or coax cable input, and has facilities for AM and CW, a switchable noise limiter and audio filter.*

### SPECIFICATIONS

Power requirements: 24V DC at 1.8 amps

Frequency coverage:

Band 1 2.0-3.0 MHz  
2 3.0-4.5  
3 4.5-6.8  
4 6.8-9.1  
5 9.1-11.4  
6 11.4-13.7  
7 13.7-16.0

Mode of operation:

Reception of AM, CW and FSK. SSB possible using inbuilt variable BFO.

Sensitivity:

AM-5 microvolts for full audio output  
Signal to noise ratio:

AM 6.5 microvolts for 20 dB

Selectivity:

AM-5 kHz-7 kHz at 6 dB

less than 12 kHz at 60 dB

CW-150 Hz at 3 dB

600 to 1000 Hz at 20 dB

Antenna:

1-long wire

2-80 ohm via a BNC socket

IF Frequency:

460 kHz

Stability after 15 minute warm up:

50 Hz per MHz

Dial Calibration:

5 kHz per division, 40:1 reduction ratio of tuning dial.

AF output:

150 mW into 50 ohms.

Weight:

approx 17kg

Valve line up:

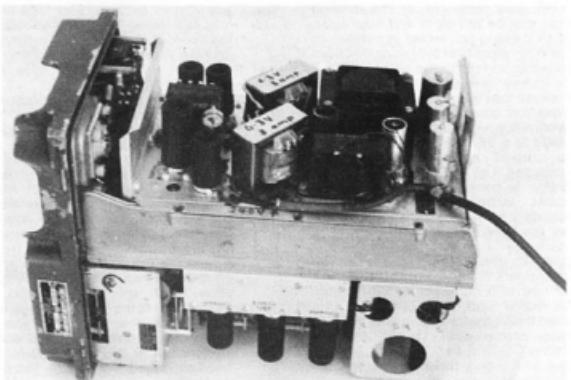


SERIAL NO.	TYPE	FUNCTION	EQUIVALENT
V1	CV4015, CV131	RF amp	6065, EF92
V2	CV4012, CV453	Mixer	68E6
V3	CV4015, CV131	1st IF amp	6065, EF92
V4	CV4015, CV131	2nd IF amp	6065, EF92
V5	CV4015, CV131	3rd IF amp	6065, EF92
V6	CV4025, CV140	AGC Rectifier/detector	6058, EB91
V7	CV4010, CV850	1st AF amp	6AK5, EF95
V8	CV4010, CV850	2nd AF amp	6AK5, EF95
V9	CV4003, CV491	10 kHz multivibrator	12AU7, ECC82
V10	CV4010, CV850	100 kHz crystal oscillator	6AK5, EF95
V11	CV4010, CV850	Local Oscillator	6AK5, EF95
V12	CV4010, CV850	BFO	6AK5, EF95
V13	CV4010, CV850	IF cathode follower	6AK5, EF95
V14	CV4025, CV140	Noise Limiter	6058, EB91
V15	CV286	95V Stabiliser	95A1

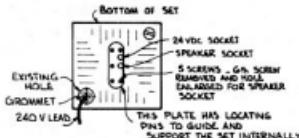
In the above list the valve type numbers are given for the high reliability version e.g. CV4015 and the standard version e.g. CV131. Equivalents are given for US and English commercial valves.

### PRINCIPLE OF OPERATION

RF signals are fed through the appropriate aerial circuit via Band Switch SWB to the RF amplifier V1. The signal is mixed in V2 with the local oscillator, V11, output; operating 460 kHz above the signal frequency. Three IF stages, V3, V4 and V5, amplify the signal at 460 kHz. V6 detects the audio in one half and acts as the AGC rectifier in the other diode half. V7 and V8 are audio amplifiers.



Internal View Showing Mod 4.



Rear View Showing Mod 3.

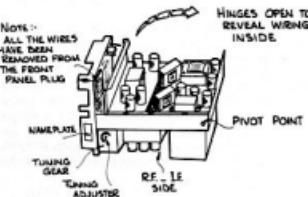


Figure 1 — Rear View.

Output is via a transformer matching to 50 or 150 ohms. The BFO V12 is variable from the front panel about  $\pm 5$  kHz. V13 provides an 80 ohm IF output on the front panel for FSK, or as the army call it, CFS, Carrier Frequency Shift. The double diode V14 operates as an audio noise limiter switchable from the front panel.

A 100 kHz crystal oscillator V10 is switched on for calibration and V9, a double triode connected as a multivibrator, gives 10 kHz calibration signals. A 1 kHz audio filter, L12 and C99, is switched in on the CWF switch position. AGC is applied to V1, V2 and V3, in the Cal 10 kc/s, Cal 100 kc/s and AGC switch positions but in the CWF, CW and Man GC positions a 1 meg ohm pot ganged with the 0.5 meg ohm audio gain control is brought into the AGC line and supplied with -30V. The audio gain pot is then inoperative.

#### POWER SUPPLY

The power supply uses a self-rectifying vibrator and a transformer, with a choke and capacitor for HT output. Separate windings give filament and bias voltages. V15 is a 95V stabiliser feeding the local oscillator and mixer. Voltages required in the set are:  
 HT1 +175VDC at about 150 mA  
 HT2 +95VDC at about 50 mA  
 Filaments 6.3VAC at about 2.5 A  
 Bias -30VDC

An interesting feature of the power supplies for the various units is a relay which switches out resistance, or in the R210, switches transformer tappings to maintain HT voltages when the input voltage drops below 23.5V. In the R210 this is relay RLA/4 which can be permanently energised if the input voltage is less than 30V.

#### FRONT PANEL INTERCONNECTION PLUG — PLA

If you examine this plug you will see it has a letter beside each pin. The significance of each is:  
 A — 24VDC input positive  
 B — 24VDC input earth  
 C — HT1 (+175V) output from PSU  
 D — to HT1 input to set  
 E — 6.3V heater output from PSU  
 F — to valve heaters  
 G — earth same as B  
 H — 30V input from C11 (in parallel with PSU supplied -30V)

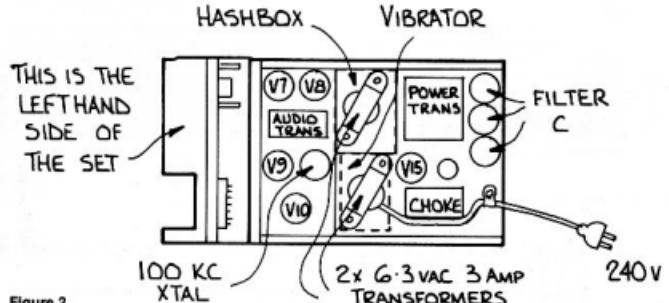


Figure 2.

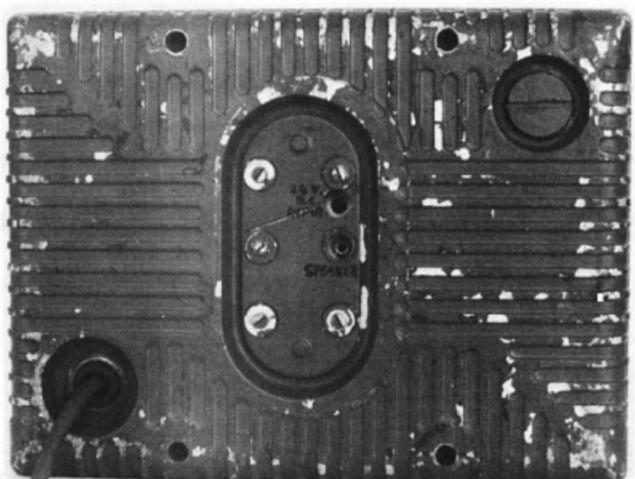


Figure 3.

J — voltage control relay RLA4  
K — Audio Output — 50 to 150 ohm  
L — Audio Output — 50 to 150 ohm  
M — 24VDC switched output

## MODIFICATIONS

(1) To operate the R210 alone you need to make the following connections:  
+ 24VDC to pin A  
earth to pin B  
pin C to D  
pin E to F  
pin J to M if input voltage is less than 30V  
Headphones, Low impedance, or a speaker to pins K and L. An 8 ohm speaker works OK.  
(2) One way to accomplish these connections is to remove the front panel connection plug and replace it with an aluminium plate. Onto this plate fit an earphone socket eg Dick Smith P-1231 and a DC power socket eg Dick Smith P-1665.  
The other wires can be soldered together as required and taped.  
(3) Another way of making a neat installation is to remove the centre bolt securing an aluminium plate with alignment pins that is bolted to the back of the case. Enlarge the hole to about 12 mm diameter to clear an earphone plug and drill a similar sized hole next to it. Mount a small aluminium plate to the RF/IF sub-assembly chassis and on this, in line with the holes in the case, fit an earphone socket and a DC power

socket. (see photo No. 3) The existing wiring can be left as is and new audio and 24V wiring connected in parallel, or it can be disconnected from the front connector and run to the new sockets. If you choose to leave the existing wiring be aware that there is an unguarded 175V on the front connector.

(4) A worthwhile modification involves fitting a 240V to 6.3V 7 amp transformer onto the power supply chassis and connecting it to the heater wiring. The vibrator is removed and two rectifier diodes connected in the 175V secondary of the set transformer. Note that they are connected in opposite polarity to a conventional full-wave, centre tap circuit. There is room for two transformers on the chassis if you can't find one with sufficient current rating. The mains lead can conveniently be routed through a large plug hole in a rear corner of the case. Do not use the existing ON-OFF switch for the 240 volt input as it's only rated for low voltage.  
(5) If you can find a dual concentric pot with one 1 megohm and one 0.5 megohm values or similar, you can replace the existing gain control and obtain independent control of RF and AF gain. You must move a brown wire from VR2 terminal with shielded connection to the VR2 centre terminal. This is helpful when resolving SSB signals.  
(6) Better performance on SSB can be obtained by converting V13 and FSK IF output, to a product detector.  
(7) Although I haven't tried it, it would not be too hard to change the BFO variable capacitor to a switch connecting one of

two trimmer capacitors for USB or LSB.  
(8) You can retune the IF to 465 kHz, from the 460 kHz, if you wish to fit a crystal or ceramic filter for better selectivity. Local oscillator frequency will have to be adjusted.

(9) If you carried out modifications to provide alternative connections to the front panel interconnection plug PLA then you can remove the front panel connection plug altogether and fit an S-meter in its place. You may have to enlarge the hole to suit. I haven't detailed any circuit as there are plenty of S-meter circuits in the technical literature.  
(10) On the cosmetic side; if you carefully scrape the paint off the raised lettering on the front panel you highlight them in silver on a green background.  
(11) On many sets the tuning is inoperative. I don't know how this came about but invariably a small ball on the end of a worm shaft in the tuning gearing has been dislodged. You usually find the ball somewhere in the case and it only requires infinite patience to replace it. There is supposed to be a ball at each end of the shaft, held under tension by screwed adjusters sealed with red paint. Undo one of the adjusters and fit the missing ball back by whatever means you can. (see fig 3) I have found that a dab of grease on a toothpick will hold the ball whilst you juggle it in. Tighten up the adjuster just enough to eliminate end play and lock it up again. If you choose to fiddle with the rest of the tuning gearing — best of luck!



AUSTRALIAN LADIES AMATEUR  
ASSOCIATION

# ALAR

Margaret Loft VK3DML  
28 Lawrence Street, Castlemaine, Vic. 3450

Hello again to all. The months are rolling on very quickly. The good news this month is the rain we have been enjoying this week, do hope the drought really has broken and all the water related problems are over.

haven't heard any new callsigns from the last exam but do hope some are about to appear on the bands.

Our secretary Jessie VK3VAN and OM Gordon VK3BGB are on the move, hope you both enjoy suburbia after the country life. Good luck to you both from us all in ALARA.

If you want to join ALARA please write to Valda VK3DVT, Post Office Box 4, Church St, Brighton 3186, for details, she will be very pleased to hear from new YL's.

Annual meeting will be on Monday 25th July at 1030 UTC. Some of our office bearers have indicated they will not be available for re-nomination so please give some thought to whether you have the time to help in the Administration of ALARA in the next twelve months. Nomination forms

will appear in April newsletter. If you feel able to assist, please offer to help in the capacity you prefer and this will ensure the continuity of our group in the future.

ALARA nets on Monday nights for the first ½ to 1 hour (at discretion of net control) are for YL's only. After this the OM's are very welcome to join in, either for contacts for the award or just to chat. If you want to get a message through for one of the girls on the net indicate this to net control when you call in. We have acted as liaisons at times and also in emergency situations. So please call in any Monday night, when you have time.

Margaret VK4AOE invites all YL's to join in on Wednesday nights at 1000 UTC on 3563 MHz ± GRM. I called in one night but band conditions weren't favourable, so better luck next time.

Until next month all the best to you all, hope you all had a pleasant Easter break. 33/73/88 to all.

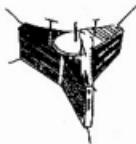


## 83/84 CALLBOOK

Work has commenced on  
the next edition!

Are your details correct  
in the last edition?  
If not please notify the WIA  
Federal Office —

PO Box 300  
South Caulfield  
Vic. 3162.



# AMSAT AUSTRALIA

Bob Arnold VK3ZBB  
41 Grammar Street, Strathmore Vic 3041

## NATIONAL CO-ORDINATOR

Chris Robinson VK3ACR

## INFORMATION NETS

AMSAT AUSTRALIA

Control: VK3ACR

1000 UTC Sunday

7.064 MHz in Summer

3.680 MHz in Winter

AMSAT PACIFIC

Control: JA1ANG

1100 UTC Sunday

14.305 MHz

AMSAT SW PACIFIC

Control: W6CG

2200 UTC Saturday

28.880 MHz

Participating stations and listeners are able to obtain Basic Orbital Data including Keplerian Elements, from the Amsat Australia Net. This information is also included in some WIA Divisional Broadcasts.

## OPERATIONAL UPDATE

AMSAT OSCAR 8

The operating schedule of Mode 'A' on Sunday, Monday and Tuesday; Wednesday rest day and Mode 'J' on Thursday, Friday

and Saturday continues to apply and will so for the foreseeable future. The possibility of severe battery problems appears to have been averted as operation of the transverters on both modes is now quite normal.

Information from Ed VK2ADJ indicates that the battery voltage and spacecraft temperature are now normal.

### THE RS SERIES

All RS satellites are working normally. Some slight deviation to the RS5 telemetry on 29.452 MHz has been observed and this is understood to be connected with the use of RS5 codestore by the Soviet Antarctic Expedition.

Lev Labutin UA3CR heads up the communications section of the Expedition using the call sign 4K1CR. With the RSS transponder off the Robot-Codestore channel on 29.330 MHz is used to store and exchange messages between the Antarctic and Moscow.

### UOSAT OSCAR 9

After a protracted period of analysis and manoeuvring the UO9 spacecraft was stabilised early in March and deployment of the Boom commenced. Extension proceeded satisfactorily for the first metre of

the fourteen metre total length but at one point the boom became snagged with the cables connecting it to the spacecraft. The situation was analysed and it was hoped to free the boom by 'rocking' it to and fro.

The boom is important to the overall success of the UOSAT project as it acts as an antenna for the HF Beacons and carries other experiments — see the UOSAT Technical Handbook (obtainable from AMSAT-UK) for further details.

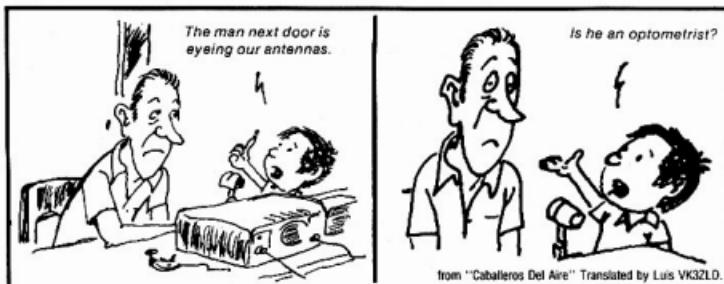
## 1983 ORBITAL DATA

	ORBITAL PERIOD	INCREMENT
	MINUTES	DEGREES WEST
Oscar 8	103.1676	25.7943
UOSAT 9	94.7095	23.6763
RS 3	118.5196	29.7567
RS 4	119.3930	29.9754
RS 5	119.5547	30.0155
RS 6	118.7168	29.8060
RS 7	119.1949	29.9256
RS 8	119.7622	30.0676

The Orbital Period and Increment are estimated figures for 1st May 1983.

## SATELLITE ORBITAL DETAILS FOR 1983

SATELLITE	OSCAR 8	UOSAT 9	RS 3	RS 4	SATELLITE	RS 5	RS 6	RS 7	RS 8
Epoch	78.43168648	79.36845551	78.48020060	49.18893777	Epoch	79.07073722	49.1519053	80.34568084	80.03962658
Decay	1.36e-6	55.51e-6	4e-8	1.12e-6	Decay	11e-8	21e-8	-7e-8	2.01e-6
Inclination	98.7644	97.5327	82.9581	82.9499	Inclination	82.9599	82.9567	82.9577	82.9420
RAAN	95.4240	45.3113	25.7519	46.1033	RAAN	30.5515	42.9474	28.0496	30.9627
Eccentricity	.0006262	.0001214	.0057404	.0018223	Eccentricity	.0009657	.0049012	.0020583	.0021866
Arg Perigee	198.7280	273.6305	221.1520	353.2768	Arg Perigee	326.1409	299.0670	247.4133	4.0044
Mean Anomaly	161.3667	86.4783	138.5206	6.8045	Mean Anomaly	33.9068	60.5489	112.4729	356.1061
Mean Motion	13.96548127	15.21124015	12.15575695	12.06661508	Mean Motion	12.05039402	12.13552541	12.08674848	12.02935935
Orbit No	25671	8029	5553	5159	Orbit No	5512	5188	5544	5514
Element Set	741	439	52	85	Element Set	78	49	94	202



# VHF UHF - an expanding world



Eric Jamieson VK5LP  
1 Quinns Road, Forrester, SA 5233

All times are Universal Co-ordinated Time,  
indicated as UTC.

## AMATEUR BAND BEACONS

FREQ CALL SIGN LOCATION

50.005	H44H1R	Honiara
50.005	JA21GY	Meie
50.020	GB3SIX	Anglesley (1)
50.060	KH6EQI	Pearl Harbour (2)
50.075	V86SIX	Hong Kong
51.020	ZL1UHF	Auckland (3)
52.013	P29SIX	New Guinea
52.100	VK0AP	Macquarie Island
52.200	VK8VF	Darwin
52.250	ZL2VHP	Palmersont North
52.300	VK6RTV	Perth
52.320	VK6RTT	Carnarvon
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.400	VK7RNT	Launceston
52.420	VK2WI	Sydney
52.425	VK2RGB	Gunnedah
52.435	VK3RMV	Hamilton
52.440	VK4RTL	Townsville
52.510	ZL2MNF	Mt Clunie
144.400	VK4RTT	Mt Mowbullan
144.420	VK2WI	Sydney
144.465	VK6RTT	Albany
144.475	VK1RTA	Canberra
144.480	VK8VF	Darwin
144.550	VK5RSE	Mt Gambier
144.600	VK6RTT	Carnarvon
144.900	VK7RTX	Ulverstone
145.000	VK6RTV	Perth
147.400	VK2RCW	Sydney
432.410	VK6RTT	Carnarvon
432.440	VK4RBB	Brisbane
432.450	VK3RMB	Mt. Buminyong

(1) Confirmation to hand that this beacon is operating with 100 watts ERP to a three element yagi beaming west, and an invitation to list it. (The days are gone when one can safely say it may never be heard, that statement disproved regarding lots of stations in Cycle 21, also contacts between G land and VK6 have been made on 6 metres, so let's be adventuresome and include it... VK5LP)

(2) "Break In" magazine from NZART says this beacon is now on 50.064, and they are closer than we are and have probably heard it lately. Can anyone confirm frequency from VK?

(3) ZL1UHF now operating on 51.020 in lieu of former 51.022.

## SIX METRES IN THE UNITED KINGDOM

Norman Fitch, G3FPK, is the Editor "VHF Bands" for the "Shortwave Magazine" published in the UK, and has written to say that "Following negotiations between the RSGB and the Home Office, forty UK radio amateurs now have permission to operate in the 6 metre band. Now we have a domestic TV service in Band 1 but the vast majority of

viewers receive the 625 line colour service in Bands 4 and 5 now. So there are still restrictions as to when we can operate.

"The band is from 50.0 to 52.0 MHz. The powers: A1A (CW) 16 dBW carrier power at the antenna; J3E (SSB) 22 dBW at the antenna. Operation times are outside Band 1 TV transmission hours, normally from about 0000 through 0900.

"G — England — nineteen stations licensed to operate; GI — Ulster — three stations; GJ — Jersey — three stations; GM — Scotland — ten stations; GW — Wales — five stations. Only full Class A licensees are included, no Class B, VHF only folk.

"As to the future, by Act of Parliament, as TV in Band 1 must close down by the end of 1986. However, the BBC would like to close down all the transmitters much earlier as they are costly to maintain. Lately, there has been published the Merriman Report concerned with the development of the VHF spectrum in general, and it recommended that all UK Band 1 TV be closed down by the end of 1984. Therefore, we expect that 6 metres will be available to all in the not-too-distant future. So, by the time the next sunspot cycle allows F-layer DX, we should be working VK!"

So that's the position in the UK and the forty licences so far granted is at least a start in the right direction. It will be of tremendous interest and benefit to Northern Hemisphere operators in particular, and hopefully we can eventually share in the contacts. It will be of even greater interest to us if we too can operate on 50 MHz and so place the DX operators at least in a position to work on a more world wide basis than at present.

Steve VK5AIM has sent some more pages from "The Short Wave Magazine" (mentioned above) and a plea for more adherence to the 2 metre band-plan for Region 1. It may interest you to know 144.000 to 144.150 is exclusively CW, with the first 10 kHz for EME. 144.050 is the calling frequency, 144.100 the random, ie non-scheduled — MS frequency. 144.150 to 144.499 is SSB and CW, though little CW occurs in this part. 144.300 is the SSB calling frequency, and 144.400 the calling frequency for random SSB, although 144.200 is very much in use too. 144.500 to 144.849 is basically all-mode DX operation, with 144.500 for SSTV calling, 144.600 for FSK RTTY calling, 144.700 for FAX calling, and 144.750 for ATV talkback. 144.850 to 144.990 is the beacon band. The FM band for repeaters with 600 kHz spacing input/output is from 145.000 to 145.800, with 145.300 AFSK RTTY calling frequency and 145.500 the general calling frequency. The section 145.800 to 146.000 is for

satellite communications. Reading through the notes one gets the impression there must be so many stations on the band that QRM is always a problem, especially as all of Europe is within range from time to time.

DX records in the UK are interesting. John G4BYV has had his previous 464 KM record on 9 cm broken by PA2DOL who worked over 500 km. G3AUS worked on OK station on 30/10/82 to create a new 23 cm record of 1576 km. On 13 cm the record is held by G4BYV and OK1AIW with 1027 km.

GB3CEM is a microwave beacon operating on 10.36888 GHz with 3 mW to an omnidirectional aerial, while GB3GBY is another beacon with 10 mW to a slotted waveguide, with a sixteen element beam pointing south. On 23 cm the Kent beacon GB3NWK has an ERP of 100 watts.

## NEW 1296 RECORD — HAWAII TO CALIFORNIA

That's what the headline read in the American publication. But there was one catch. It was one way only over the path of almost 2500 miles, almost double the present Australian record.

One could say it was very unfortunate that the beacon operator, Paul Lieb, KH6HME, was actually in California on business at the time the signal was received.

I am indebted to Wally VK6KZ for further fill in on the 1296 MHz scene in California, as he has recently returned from a trip to the USA, and has actually spoken to some of these operators. A group of dedicated 1296 MHz operators in Southern California are led by Chip N6CA, others include Paul KH6HME, Ed W6NGN, Garry WA6MEM, Joe K6ZMW, Robert W6PJA and Lynn W6KGS. They are anxious to make two-way communication between Hawaii and California, and keep a close watch on the weather conditions between the above two locations as well as those fronting on to Mexico.

It appears the tropospheric duct occurs around 8000 feet in Hawaii and 1000 feet in California, and often hurricanes are present in the Gulf of Mexico at the time the duct is formed as a result of rapid changes in temperature, air pressure and water vapour or moisture in the atmosphere.

Normally the KH6HME beacon runs on three bands, 144, 432 and 1296 MHz, but recently the 2 metre beacon has been withdrawn because the 2 metre path has been worked so often there seems little purpose in continuing a beacon on that band. However, on 432 and 1296 MHz the beacon mostly operates during the summer months when the formerly mentioned

rapid changes to pressure gradients etc are most likely to occur. N6CA even has a mobile 1296 MHz station and drives around the hills in his location looking for the right spot from which to work long distance signals. His mobile rig includes 144 MHz and HF gear for local contacts and general co-ordination, plus his 1296 MHz receiver with extremely low noise figure for mobile monitoring, apparently this is necessary as the end of the duct can be any height from the former 1000 feet to near ground level. Once having found the right spot, Chip can fire up a 500 watt transmitter which can be powered either from the AC mains if they are handy or a portable alternator. That must be dedication to the extreme, but it is certainly starting to pay off!

The signals in question were originally heard on 30/7/82 on 432.05, weakly at first until peaking to S9. They didn't last long enough for Paul KH6HME to get back to Hawaii from California and make it a two-way contact, as signals faded out the next day.

The California 1296 MHz operators seem to favour the loop type yagi, and a 44 element yagi with a boom length of twelve feet can be used for mobile operation. These operators favour the loop yagis due to much less wind loading than with a six to eight foot dish to give similar gain, and are easier to feed than a dish.

Chip, N6CA, has ensured the best possible set-up for the Hawaiian end of the circuit by constructing most of the equipment being used, himself. Four 25 element loop yagis vertically mounted one above the other give about 24 dB gain, are fed with heliax from a 30 watt transmitter, and the beacon is located on Mauna Loa, an active volcano, at about 8000 feet ASL, and it takes Paul KH6HME about three quarters of an hour to get there from his home after being alerted the band is open. Wally says its some drive too, through lava flows which are black in colour, and the road would be hard to see at night as it is just bulldozed through the lava!

Whatever the outcome of the signals on 30th July, it would be remiss of us in Australia if we didn't say well done to the USA operators who have put so much time and effort into trying to span such a distance, and we wish them well in the future, knowing it is only a matter of time before the crossing becomes two-way. We all await that time with interest. Perhaps to keep the world record in Australia we should be striving to span the distance between VK6 and New Zealand, and I see no reason why it should not be done eventually if there are similar dedicated operators at both ends of the circuit here. Who is going to be first?

## LOW NOISE FIGURES

Whilst still concerned with the American scene, I have to hand, from Wally VK6KZ, some interesting figures on a pre-amp noise figure measuring contest held recently at the 1982 Central States VHF Society Conference. You may find the following figures a fair indicator of how far the "state of the art" has progressed recently.

50 MHz: WA5VJB using 3SK97 returned 0.59

dB; WB5CHW 3N204 1.25 dB.

144 MHz: VE3CRU MGF1200 0.12 dB; K7KOT D4320.18 dB; W5UN MGF1200 0.27 dB; WA5VJB MGF1200 0.42 dB; KB9NMM MGF1402 0.42 dB; KB9NMM MGF1200 0.48 dB; WB5GHW BF981 0.73 dB; WA5IED Janet 3N204 2.99 dB.

432 MHz: WB0TEM MGF1402 0.40 dB; WD4MBK MGF1402 0.58 dB; WA5HNK MGF466 0.98 dB; WSUKO PAG432 (Lunar) 1.12 dB; KR5F DXL3501 1.16 dB; KL7WE PAG432 (Lunar) 1.20 dB; WA5HNK NE64535 1.49 dB; KR5F DXL3501 1.96 dB.

902 MHz: KC0W MGF14020 0.82 dB; WB5GHW MGF1400 2.50 dB; WA5VJB MRF902 2.56 dB.

1296 MHz: WB0TEM MGF1402 0.68 dB; K9KFR MGF1400 0.99 dB; WD4MBK NE72089 1.12 dB; WB5GHW MGF1400 1.20 dB; W6PO DXL3501 1.47 dB; W5UHE MGF1402 1.71 dB.

2304 MHz: K9KFR NE24483 0.90 dB; WA5VJB NE64535 (1) 2.50 dB; WA5VJB NE64535 (2) 3.00 dB.

There were a number of other pre-amplifiers in each range except 50 MHz which were not as good as those listed, but still very satisfactory by ordinary standards.

In the Antenna Gain Measuring Contest conducted at the same venue, on 144 MHz K5RF had an eleven element quad eighteen feet long giving 13.5 dB gain, a nine element quad thirteen feet long gave 13.2 dB and a nine element wide spaced quad sixteen feet long 12.5 dB. W5UN submitted a home brew twenty-six foot long quagi with 12.5 dB gain.

On 432 MHz: K5GW submitted a twenty-four element Cushcraft yagi with 14.5 dB gain. WD4MBK submitted three, nineteen element home brew yagis to the RIW design producing 13.9, 13.9 and 13.5 dB respectively, W3XO submitted a sixteen element yagi with 12 dB gain.

On 1296 MHz: WS5UR obtained 17.2 dB gain with a Tonna yagi; WA5TKU 16.0 dB loop yagi; K5FN 15.5 loop yagi; W5DC 14.5 dB yagi.

On 2304 MHz: WA5VJB 19.5 dB with forty-one element loop yagi; WB5LUA 8 dB with a one pound coffee can dish feed antenna, and his reference dipole naturally gave 0.0 dB!

So all you home builders will now have some specifications to attempt in both preamplifiers and antennas, so I expect soon to be hearing reports of improved signals on all bands!

## EME EXPERIMENT

Wally, VK6KZ, has kindly telephoned me with information on forthcoming EME experiment on 14/5, 15/5 and 16/5/83 which could promote quite a degree of interest for those 70 cm stations having a reasonable degree of DX capability.

Callsign to be used is K8HUU and will be operating from Greenbank, West Virginia, and running 150 watts to a 150 foot dish, which should have a gain around 44 dB giving 3.86 megawatts ERP! Transmitting frequency will be 432.100 and they will be tuning for replies fairly widely both above

and below that frequency, so it may be preferable for those replying to spread out a bit to reduce the possibility of being clobbered by someone more powerful.

Stations at this end, it is considered, will need about 1 kW ERP, which can be obtained from 100 watts to a 10 dB gain antenna (but remember to allow for cable losses when making your calculations!). It is likely most contacts will be made with CW but if everything is just right it might be possible for some SSB contacts to be made.

On the receiving side a masthead amplifier would be very desirable, preferably of the GaAs FET variety. As the new moon and the sun will both be in the same quadrant during the experiments, it is likely the level of sun noise will be increased, hence the better the antenna the less noise.

The window for Perth is from 50 to 60 degrees, and elevation will be just above the horizon, so your horizontal beams will be at about the right elevation.

Times for Perth are: 14/5 0020 to 0110 UTC; 15/5 0130 to 0210 UTC; 16/5 0240 to 0330 UTC. Due adjustments from these times will need to be made depending on moonrise and where you live.

Good luck with the experiment to those who have the right equipment, but remember, don't transmit on 432.100 because you could block out the signals from K8HUU to someone who is actually copying him and this would be a pity. Certainly there is no point in putting your transmitter on the air unless you can actually hear K8HUU. Whilst he might hear your transmitter if you have enough ERP, unless you can HEAR HIM then no contact will result! Doppler shift will also make it necessary for you to track his signal as he is transmitting, so you are going to be busy. Those with some of the more recent gear with twin VFO capability will have a head start in any case.

More information will probably be available as the time approaches. If you are serious then perhaps a brief few words with EMEers such as VK5MC and VK6ZT could provide you with additional information, but don't overload them, they will probably be very busy themselves at the time, or leading up to the experiments.

## NEW 10 GHz EUROPEAN DX RECORD

"Break In" for February 1983 gives evidence of "a new record has been established on 10 GHz of 1166 km between I0SNY/EAS located near Valencia, Spain, who worked back to Italy to IW0BFZ near Rome. This sea path across the Adriatic Sea was achieved on 10th July 1982 on 10.525 GHz. Equipment in use is believed to be 30 milliwatt Gunnplexers to one metre dishes at both ends."

"Nicola Sanna I0SNY has over the last few years been investigating enhanced propagation across the Adriatic Sea (off the east coast of Italy) and has held the world DX record twice on 10 GHz work, over this same path, once at 757 km and once at 860 km. This path is geographically interesting in that it is well sheltered by land masses and together with mid summer temperatures and calm weather conditions

has led to a high incidence of tropospheric ducting propagation.

"In addition to his 10 GHz work, Nicola was active on 1296 MHz and amongst other DX contacts worked I2KSX/8 in Calabria (southern Italy) at a distance of 1396 km thus creating a new European DX record on this band; he was using only 4 watts to a 17 element yagi. Thanks to QST for the report."

#### VK0AP — MACQUARIE ISLAND from GII VK3AUI

A number of problems have arisen with this operation by Peter McLennan.

1. *Liaison on 14 MHz. Due to the small size of the base there have been EMC problems with the station radio equipment.*

2. *The six metre equipment has an EMC problem with a scientific instrument called a Riometer. This equipment is very sensitive and is used to listen to cosmic radio noise. It consists of two receiver chains. The equipment operates on a frequency of 35 to 40 MHz with a local oscillator of 43 MHz and an IF of 3 to 8 MHz. The input filtering is not sharp.*

Filters have been sent to Peter for the Riometer but it is up to the operator of the Riometer to fit them. Approval in principle for their use, has been obtained, but it is up to the people on the island.

Peter has been looking at the alternatives listed.

a. *Resiting amateur gear as far as possible from the equipment affected.*

b. *Using antenna polarisation changes to reduce the signal at the Riometer.*

c. *Using the antenna beam pattern nulls to reduce the signal at the Riometer.*

d. *Filters on the Riometer but this requires fitting by a third party.*

e. *Reduction of power from 100 W to 10 W as a last resort.*

Unfortunately the deteriorating weather, as winter approaches, and also Peter's work commitments may preclude opera-

tion. Operation will only be permitted when all EMC problems have been resolved to the satisfaction of all parties.

There is still hope of further six metre operation before Peter leaves the island in November.

From Paul ZS1BR in Cape Town comes news of the VHF amateur radio beacon which has been established for the benefit of the radio amateurs in the Western Cape Province and hopefully the international community under good propagation conditions.

The beacon transmits continuously as follows: firstly, in frequency shift keying CQ DE ZS1SIX QTH PIKETBERG SA FSK MODE PSE QSL TO ZS1CT 73. The beacon then changes mode and transmits using FM with an audio tone of approximately 1 kHz and constant carrier CQ DE ZS1SIX QTH PIKETBERG RSA FM MODE PSE QSL TO ZS1CT 73.

The output power is 16 watts, feeding a vertically polarised ground plane antenna. The crystal-controlled frequency is 50.945 MHz.

The location of the beacon is Asvöelskop 32° 54' 57"S, 18° 44' 20"E at an altitude of 807 m ASL above the town of Pieterberg.

The beacon was built up by ZS1SG and ZS1BR, and all reception reports and QSL cards should go to ZS1CT.

#### GENERAL NEWS

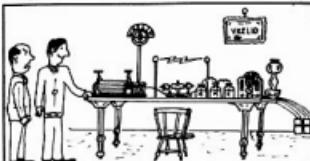
I wonder what that is? It's very scarce this month, the bands here have been very quiet. Still the occasional JA contacts on 6 metres, a few weak signals across "The Bight" to and from Albany on 2 metres. Bob VK5ZRO and his group continue to work 144 and 432 MHz up and down Eyre Peninsula and to Woomera, whilst others must have got out their knitting and are relaxing!

Eric Trebilcock L3-0042 sends a short note to advise that my statement re Chatham Island being south of New Zealand (Feb "AR") was wrong, and that the island is actually east of New Zealand, with people living in Christchurch saying "its out there" and pointing east. Thanks for putting the record straight Eric, my maps didn't show the island and the fact that it was to have a station signing ZL40Y/C1 took a punt on its position, and of course I was wrong!

I wonder if April 1983 will bring any exotic DX across the Pacific Ocean? April 1982 didn't cause a great deal of excitement on 6 metres. My next set of notes will probably tell the story.

Closing with the thought for the month: "If you realise that you are not as wise today as you thought you were yesterday, you're wiser today." 73. The Voice in the Hills.

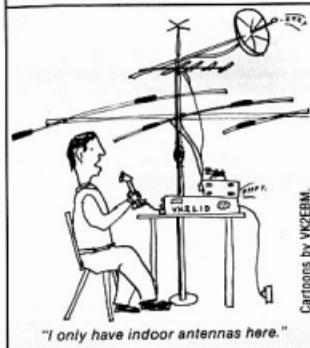
AR



"Wadya mean — nice antique collection?  
This is my working rig."



"Negative your QRG OM — I've lost track of which rig I'm using!!!"



Cartoons by VICEBIRD



LtoR: GII VK3AUI, AI VK0CW and Lionel VK3NM in GII's shack discussing Heard Island 6m activity during AI's visit to Melbourne enroute back to America after the Heard Island Expedition.

# EASTERN

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COMMUNICATIONS, ELECTRONICS AND COMPUTERS

## WE HANDLE ALL COMPUTER REPAIRS



**\$670**

The R-2000 provides outstanding performance through use of microprocessor controlled operating functions, allowing maximum flexibility and ease of operation throughout its operating range. An all mode receiver, it covers 150 kHz-30 MHz in 30 bands, on SSB, CW, AM, and FM. Key features include digital VFO's, ten memories that store frequency, band, and mode information, memory scan, programmable band scan, digital display with 24 hour dual clock, plus timer, and a host of other features to enhance the excitement of listening stations around the world.



### Dip Meter **\$135**

The DM-81 dip meter is intended for adjustment of radio equipment and antennas.

It is a self-excited oscillator designed for external coupling to the equipment being tested.

#### FEATURES

- Measurable frequency range of 700 kHz-250 MHz in seven bands
- Capacitive Probe for measurements without removing coil shields
- Storage compartment for all seven dip meter cells, capacitive probe, earphone and ground clip lead
- Convenient for both in indoor and outdoor measurements, all solid-state with built-in battery.



### HF Transceiver **\$819**

ICOM's IC-730 is the "go anywhere HF rig for everyone's pocketbook". This compact size HF transceiver for the amateur band will fit in extremely small spaces, measuring only 3.7" x 7.5" x 10.8" deep, the unit is perfect for car, airplane, boat or suitcase portable operation. Convenient to use features such as 3-speed tuning with tuning rates of 1 kHz, 100 Hz or 10 Hz, electronic dial lock, 1 memory per band, and dual VFO's are built in at no extra cost.

The IC-730 is full featured: 200 watts PEP input, receiver pre-amp, VOX, noise blanker, large RIT knob, speech processor, IF tuning standard, fully solidstate broadband tuning.



Now with green display.

### 2 Metre/FM **\$395**

Try to imagine 25 watts, 5 memories and 2 scanner systems in a 2" high, 5 1/2" wide and 7" deep 2-metre transceiver! The IC-25A is a full-featured FM transceiver for the space conscious operator.

The IC-25A is no lightweight when it comes to features: 5 memories... Priority channel... 25 watts high... 1 watt battery saving.



**\$1999**

The TS-930S is a superlative, high performance, all solid-state, HF transceiver capable of operation in the SSB, CW, FSK, and AM modes on all Amateur 160 through 10 meter bands. It incorporates an excellent general coverage receiver with an exceptionally high dynamic range (100dB typical on 20 m, CW bandwidth) having continuous coverage of all frequencies from 150 kHz through 30 MHz.

Keyed to the exacting requirements of the DX and contest operator, the TS-930S provides a variety of the most useful performance features, including new, innovative, interference rejection circuits, such as SSB slope tuning, CW VBT (variable bandwidth tuning), IF notch filter, CW pitch control, and audio peak-tuned CW filter. Equally important, the TS-930S design includes dual digital VFO's, eight memory channels, CW full break-in switchable to semi break-in, a unique built-in automatic antenna tuner, and a new higher voltage operated solid-state final amplifier that provides ultimate in reduction of IM and spurious emissions.

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**PHONE ENQUIRIES: 288 3107**

HOURS: MON-FRI. 9-5.30. SAT. 9-12.

Bankcard welcome or we can arrange finance.

**\$1199**

The TS-830S is a high-performance, HF SSB/CW transceiver with every conceivable operating feature built-in for 160 through 10 metres (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning, IF shift, and an IF notch filter, as well as very sharp filters in the 455 kHz second IF. Its optional VFO-230 digital VFO provides five memories. The TS-830M includes AM mode built in.



**\$495**

**Automatic HF Antenna Tuners 500 and 100 Watt Models**

The IC-AT500 and the IC-AT100 Automatic Antenna Tuners provide automatic adjustment of the ICOM HF transceivers to the transmission line. Working at 500 and 100 watt levels respectively, the IC-AT500/100 detects the resistance and reactance of the load presented by the transmission line. Powerful motors tune the two variable capacitors, so that the tuner presents a 50 ohm nonreactive load to the transceiver.

**\$357**

**Automatic HF Antenna Tuners 500 and 100**

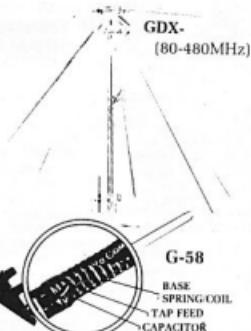
**Watt Models**



## HOXIN

HF-5DX	<b>\$187</b> 3.5 to 30 MHz trapped vertical antenna which is completely self-supporting, no guys are necessary. Height 6.6 metres.
G-SS	<b>\$15</b> Heavy duty die-cast gutter mount.
RINGO	<b>\$60</b> 2 metre high gain vertical 9 dB gain
RK-1	<b>\$18</b> Radial kit for Ringo.
F-1E	<b>\$15</b> 2 metre Rubber Duck with PL-259 base.
SCAN-X	<b>\$62</b> Broadband receiving discone antenna 65 to 520 MHz for use on Scanning Receivers.
GDX-1	<b>\$98</b> Transmitting discone antenna, 80-480 MHz.

## HF5-DX



## VoCom

### VOCOM G-58 \$42

Telescopic 2m x  $\frac{5}{8}$  wave antenna to suit all hand helds. Up to 7 dB over a rubber ducky.



## UM PRODUCTS

A-248D **\$93** Triband trapped dipole for 80, 40 and 20 metres. Overall length is 60 feet. Maximum power 500 W. Ideal 80 Mx antenna for small backyards.



- \* 4 KHz BW at -6 dB on SSB
- \* Size 325 W x 230 D x 140 H mm.

**\$425**

## AUSTRALIAN AGENT & DISTRIBUTOR

## GFS ELECTRONIC IMPORTS

Division of GD &amp; JA WHITER PTY LTD

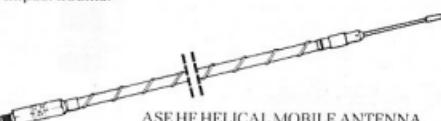
## ANTENNA SCIENCE & ENGINEERING

### AMATEUR AND COMMERCIAL ANTENNAS, HELICAL MOBILE ANTENNAS

The ASE range of HF Helical Mobile antennas is designed to give you a signal to be proud of and get it further out because each antenna uses every known method to increase mobile efficiency.

- \* Thick wire (0.6 mm) to decrease resistive losses.
- \* Top winding—to increase current-length product.
- \* Top loading—large brass mass to act as capacity hat.
- \* Parallel former—allows top winding to be smaller in length producing a longer radiating part.

In addition you get top quality chrome plating,  $\frac{1}{16}$  stainless steel grub screw and adjustable sliding tuning tip and Allen key. Plus extra thick heat shrink to minimize impact trauma.



**Super G-80/15/10** Triband helical covering 80, 15 and 10 meters, overall height on 80 meter is 7 feet.

**G-80** **\$46** 80 meter heavy duty helical, 6 feet long.

**G40 to G-10** **\$40** 40, 20, 15 and 10 meter helicals, 5 feet long

**G-BM** **\$26** Stainless Steel bumper mount to suit the ASE Helicals, female,  $\frac{1}{4}$  x 24 thread.

## J.I.L.

### JIL MODEL SX-200 HF/VHF/UHF PROGRAMMABLE SCANNING RECEIVER

THE SX-200 includes many unique features not provided on any other scanner. For example, its wide frequency coverage of 26 to 88, 108 to 180 and 380 to 514 MHz. Its capability of receiving over 33,000 channels. 3 mode squelch that can be set to only allow the SX-200 to stop on carrier with modulation signals. 16 Memory channels that can be expanded to 32 with the EXP-32 kit. AM and FM detection on all bands. For full details write or call us.

**\$599**

SX-200  
HF/VHF/UHF  
33,000  
CHANNELS

**EXP-32 \$53**

Memory Expander kit increases memory channels in SX-200 from 16 to 32 channels.

**A-1AM \$32**

Air Band Auto AM Kit.

## SEIKI ELECTRONICS

Century 21D Digital HF Communications receiver is designed for the keen SWL who desires a quality digital HF Receiver at a reasonable price. The Wadley loop combined with a 5 digit orange LED display makes operation of this new receiver a breeze. Some important features include:

- \* 0.5 to 30 MHz
- \* 0.3 uV on SSB
- \* CW, USB, LSB, & AM.
- \* 1 uV on AM

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Phone: (03) 873 3939, 873 2652



# CONTESTS



## CONTEST CALENDAR

### MAY

- 7-8 Florida QSO Party
- 7-8 G-QRP Day
- 7-8 CO M Russian Test
- 7-8 World Telecom Phone Test
- 14-15 World Telecom CW Test
- 14-15 Sangster Shield Test
- 17 World Telecommunications Day
- 28-29 CO WW WPX CW Test

### JUNE

- 4-5 RSGB National Field Day
- 11-12 South American CW Test
- 11-13 6th VK/ZL Oceania WCY RTTY Test
- 11-12 ARRL VHF Test \*\*\*
- 18-19 All Asian Phone (Log available FCM)
- 18-19 Nine Lands CW Test
- 25-26 ARRL Field Day

### JULY

- 2-3 Venezuela Phone Test \*\*\*
- 9-10 NZART Memorial Test (June AR)
- 9-10 IARU Radiosport Test
- 16-17 International QRP Test \*\*\*
- 16-17 SEANET CW Test
- 23-24 Venezuela CW Test \*\*\*

### AUGUST

- 6-7 DARC WAE CW Test
- 13-14 SEANET Phone Test
- 20-21 SARTG RTTY Test
- 27-28 All Asian CW Test

The contests marked with \*\*\* are not yet confirmed.

## WCY COMMEMORATION, THE 24th ALL ASIAN DX CONTEST

### 1 CONTEST PERIOD:

- (1) Phone: 48 hours from 0000 UTC 18 June, 1983 to 2400 UTC 19 June, 1983
- (2) CW: 48 hours from 0000 UTC 27 August, 1983 to 2400 UTC 28 August, 1983

### 2 BANDS:

Amateurs bands under 30 MHz.

### 3 ENTRY CLASSIFICATIONS:

- (1) Single operator, 1.9 MHz band (CW only)
- (2) Single operator, 3.5 MHz band
- (3) Single operator, 7 MHz band
- (4) Single operator, 14 MHz band
- (5) Single operator, 21 MHz band
- (6) Single operator, 28 MHz band
- (7) Single operator, Multi band
- (8) Multi operator, Multi band

### 4 POWER, TYPE OF EMISSION and FREQUENCIES:

Within the limits of own station licence.

### 5 CONTEST CALL:

- (1) For Asian stations:
  - (a) Phone ... "CO contest"
  - (b) CW "CO test"
- (2) For non-Asian stations:
  - (a) Phone ... "CO Asia"
  - (b) CW ... "CO AA"

Reg Dwyer VK1BR  
FEDERAL CONTEST MANAGER  
Box 236, Jamison ACT 2614

### 6 EXCHANGE:

- (1) For OM stations: RS(T) report plus two figures denoting operator's age
- (2) For YL stations: RS(T) report plus two figures "00 (zero zero)"

### 7 RESTRICTIONS ON THE CONTEST:

- (1) No contact on cross band
- (2) For participants of single operator's entry: Transmitting two signals or more at the same time including cases of different bands is not permitted.
- (3) For participants of multi operator's entry: Transmitting two signals or more at the same time within the same band, except in case of different bands, is not permitted.

### 8 POINT AND MULTIPLIER:

- (1) For Asian stations
  - (a) Point ... Perfect contact with non-Asian stations will be scored as follows:
    - 1.9 MHz band ..... 3 points
    - 3.5/3.8 MHz bands ..... 2 points
    - Other bands ..... 1 point
  - (b) Multiplier ... The number of different countries in the world worked on each band. According to the DXCC countries list.
- (2) For non-Asian stations
  - (a) Point ... Perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan, KA stations) will be counted as follows:
    - 1.9 MHz band ..... 3 points
    - 3.5/3.8 MHz bands ..... 2 points
    - Other bands ..... 1 point
  - (b) Multiplier ... The number of different Asian Prefixes worked on each band. According to the WPX rules.

### (3) JD1 stations

- (a) JD1 stations on Ogasawara (Bonin and Volcano) Islands belong to Asia.
- (b) JD1 stations on Minamitoru Shima (Marcus) Island belong to Oceania.

- (4) Contacts among Asian stations and among non-Asian stations will neither count as a point nor multiplier.

### 9 SCORING:

- (The sum of the contact points on each band) times (The sum of the multipliers on each band).

### 10 INSTRUCTIONS ON THE SUMMARY AND LOG SHEET:

Please keep all times in UTC.

Please fill in the blanks of "multiplier" by countries or prefixes, only the first time on each band.

### 11 AWARDS:

- (1) For both phone and CW, certificates will be awarded to those having the highest score in each entry in proportion to the number of participants from each country and also those from each call area in the United States.
  - (a) The number of participants under 10 ... Award only to the highest scorer.
  - (b) From 11 to 20 ... Award up to the runner-up.

- (c) From 21 to 30 ... Award up to the top third.

- (d) From 31 or more ... Award up to the top fifth.

- (2) The highest scorer in each Continent of the single operator multi band entry will receive a medal and certificate from the Minister of Posts and Telecommunications of Japan.
- (3) The highest scorer of the multi operator multi band entry in each Continent will receive a medal.

### 12 REPORTING:

- (1) Submit a summary sheet and logs of only one classification.
- (2) Both log and summary sheet must arrive in JARL, PO Box 377, Tokyo Central, Japan on or before the following dates
  - (a) Phone ..... September 30, 1983
  - (b) CW ..... November 30, 1983

### 13 DISQUALIFICATION:

- (1) Violation of the contest rules
- (2) False statement in the report
- (3) Taking points from duplicate contact on the same band in excess of 2% by the total.

### 14 ANNOUNCEMENT OF THE RESULT:

- (1) Phone ..... About February 1984
- (2) CW ..... About April 1984

### 15 COUNTRIES LIST OF ASIA:

- A4, A5, A6, A7, A9, AP, BV, BY, CR9, EP, HL/HM, HS, HZ/72, JA-JR, JD1 (Ogasawara Is.), JT, JY, OD, S2, TA, UA/UK/UV/UW9-0, UD6/UK6C, D\_K, UF6/UK6F, O, Q, V, UG6/UK6G, UH8/UK8H, U18/UK8A, G1L0-T-Z, UJ8/UK8J, R, UL7/UK7, UM8/UK8M, N, V56, V88M/80, VU, VU (Andaman & Nicobar Is.), VU (Laccadive I.), XV, XV, 3W, ZX, YA, YI, YK, ZC4/584, IS (Spratly I.), 4S, 4W, 4X/4Z, 70 (S. Yemen), 9K, 9M2 (West Malaysia), 9N, 9V (Singapore), (AbuAil).

## RESULTS OF THE 23RD ALL ASIAN TEST (82) FOR AUSTRALIA

CALL	FINAL SCORE
VK2XT	61506 *
VK6NSD	25434 *
VK2DVL	20473
VK2PFO	15132
VK2NHV	6440
VK2DEW	3636
VK3VAB	3135
VK5NWS	220
VK6JS	36064 *
VK4AIX	5757

Congratulations to all those who entered the contest and represented Australia in this very popular contest, especially those who have won a certificate (\*) and all the novices who have shown us all, the way.

### EUROPEAN DX-CONTEST

- 1 Contest periods: CW: 13/14 August, Phone: 10/11 September, RTTY: 12/13 November. All from 0000 UTC Saturday to 2400 UTC Sunday.
- 2 Bands: 3.5 - 7 - 14 - 21 - 28 MHz.
- 3 Classifications: Single Operator — all band;

**Multi Operator** — Single transmitter. Multi-operator/Single transmitter stations are only allowed to change band one time within a period of fifteen minutes. A quick band-change and return for working new multipliers is allowed.

**4 Rest period:** only thirty six hours of operation out of the forty eight hours are permitted for single operator stations. The twelve hours of non operation may be taken in one, but no more than three periods at any time during the contest and have to be marked in the log.

**5 Exchange:** A contest QSO can only be established between a non-European and a European station. Exchange the usual five or six digit serial number RTS/RS report plus a progressive QSO number starting with 001. W/K stations in addition give their state (eg 599011 MA).

**6 Points:** Each QSO counts one point. A station may be worked once per band. Each confirmed QTC — given or received — counts one point (see below).

**7 Multipliers:** The multiplier for non-European stations is determined by the number of European countries worked on each band. Europeans will use the last ARRL countries list. In addition each call area in the following countries will be considered a multiplier: JA, PY, VE, VO, VK, ZL, ZS, UA90. (See special regulations for RTTY Fig 13). Each W/K state will be considered a multiplier.

The multiplier on 3.5 MHz may be multiplied by four.

The multiplier on 7 MHz may be multiplied by three.

The multiplier on 14/21/28 MHz may be multiplied by two.

**8 Scoring:** The final score is the total QSO points plus QTC points multiplied by the sum total multipliers from all bands.

**9 QTC-Traffic:** Additional point credit can be realised by making use of the QTC traffic feature. A QTC is a report of a confirmed QSO that has taken place earlier in the contest and later sent back to a European station. It can only be sent from a non-European station to a European station. The general idea being that after a number of European stations have been worked, a list of these stations can be reported back during a QSO with another station. An additional one point credit can be claimed for each station reported. (Note special regulation for RTTY see 13.)

a) A QTC contains the time, call and QSO number of the station being reported, ie: 1300/DA 1AA/134. This means that at 1300 GMT you worked DA1AA and received number 134.

b) A QSO can be reported only once and not back to the originating station.

c) Only a maximum of 10 QTCs to a station is permitted. You may work the same station several times to complete this quota. Only the original contact, however, has QSO point value.

d) Keep a uniform list of QTCs sent. QTC 3/7 indicates that this is the third series of QTCs sent and that seven QSOs are reported.

Europeans may keep the list of the received QTCs on a separate sheet if they clearly indicate the station who sent the QTCs.

**10 Contest Awards:** Certificates to highest scorer in each classification in each country, reasonable score provided. Continental

leaders will be honoured. Certificates will also be given to stations with at least half the score of the continental leader.

**11 Disqualifications:** Violation of the rules of this contest, or unsportsmanlike conduct, or taking credit for excessive duplicate contacts will be deemed sufficient cause for disqualification. The decisions of the Contest Committee are final.

**12 Logs:** It is suggested to use the log sheets of the DARC or equivalent. Send large size SASE to get the wanted number of log and summary sheets (forty QSOs or QTCs per sheet). Use a separate sheet for each band. All entrants are required to submit cross-check (dupe) sheets for each band on which they worked more than 200 QSOs. For each duplicate contact, that is removed from a log by the checker, a penalty of three additional contacts will be crossed out.

**13 Special regulations for RTTY:** In the RTTY Section of the EUROPEAN DX CONTEST also contacts between all continents and also one's own continent are permitted. Multipliers will be counted according to the EUROPEAN and ARRL countries list. QSO as well as QTC traffic with one's own country (district) is NOT allowed. SWLs apply to the rules accordingly.

**14 Deadline:** CW: September 15th; Phone: October 15th; RTTY: December 15th.

#### EUROPEAN COUNTRY LIST

C31-CT1-CT2-DL-EA-EA6-EI-F-FC-G-GD-GI-GJ-GM-GM Shetland-GU-GW-HA-HB9-HB0-HV-I-IS-IT-JW Bear-JW-JX-LA-LX-LZ-M1-0E-0H-OHO-0J0-OK-ON-OY-OZ-PA-PA-SM-SP-SV SV Crete-SV Rhodes-SV Athos-TA1-TF-UA1346-UA2-UA Franz Josef Land-U85-U2C-UN1-U05-UP2-U02-UR2-Y2-YO-YU-ZA-ZB2-1AO-3A-4U1-9H1.

Criteria for the awarding of certificates and trophies in the WAEDC. Minimal requirements for a certificate or a trophy are 100 QSOs or 10 000 points.

Mailing Address: WAEDC Committee Postbox 1328, D-895 Kauferbeuren, Germany.

#### THE ROSS HULL CONTEST 1982

The contest this year (1982) was entered by only twenty odd contestants, three of those were overseas.

The entries all were particularly well presented and most gratefully received because of the trouble and obvious care taken by the entrants.

Although there were only a few entrants those who did enter were there to make a point through the contest and most carried the same general suggestions for a change of the rules. I will make these comments public and ask for your advice on the alterations to the rules for the future contests.

Anyway, on to the results for the contest and my sincere congratulations to the winners for an excellent effort in a very difficult area of specialty.

#### COMMENTS

These comments have been received from entrants' letters and reproduced here for your advice.

From a lengthy letter from Victoria here condensed with literal licence, for the purpose

of publicity.

*"This entry is sent with the purpose of showing the impossibility of an eastern state winning the contest against the bonus scheme of VK6."*

*"It became necessary to seek other bands to increase the score over other active locals."*

*"It was necessary to design and construct equipment for 576 and 2304 MHz during the contest activity."*

*"The contribution of long distance DX would be an important part of the scoring. We note these contacts are based on normal nightly contacts and are not dependent on propagation enhancement. This is surely what Ross Hull is all about."*

*"The attitude of operators is to give the contest a 'BIG MISS' which is not in the best interests of amateur radio."*

*"The end event of the present scoring scheme is 'WHT BOTHIR,' from WA."*

*"I am not a rabid contest operator, but this is one event that has a positive aspect of encouraging the extension of activity to otherwise neglected bits of the spectrum and so must not be allowed to lapse."*

*"The times two multipliers for VK6 may need some revision," from WA again.*

*"Are mobile contacts valid?" Answer yes.*

*"If the rules as to the multipliers changes then some incentive for national and state winners for each frequency band," from VK4.*

*"Conditions very poor over the whole period. For several days on end never heard a signal from outside Rockhampton. Worst conditions for many years."*

From these comments I can draw the following tentative conclusions.

1 **The VK6 bonus of doubling the score should be dropped.**

2 **An additional incentive for each div/state for each winner of each band.**

3 **The distance and multipliers should remain the same.**

4 **Each state should compete on an even footing and scoring basis.**

The next Ross Hull Test is December this year (1983) and the same rules will apply unless you consolidate your thoughts for a change.

FCM comments. With the ever-increasing pressure of commercial stations requiring band space we are in the unenviable position of having to 'show' that we are using the bands that have been allocated and that we are using them to the advantage of the general population. We are doing this very well in the HF spectrum and have been allocated additional spectrum space at WARC 79. However this is not the case in these higher frequencies. The 'few' are again expected to maintain the status quo for all of the rest of us and for the future amateurs (your descendants).

It would be of great assistance if all the amateurs of VK showed some interest in the future of the sport and very valuable activity of amateur radio. All the best.

The winners of the 1982 Ross Hull VHF Contest are:  
Walter House VK6KZ, Seven Day Phone Section  
S Blanche, VK2KFJ, Seven Day CW Section  
Hideo Kirii JA2DDN, O/seas Seven Day Phone Japan

Yutaka Kato JH1WHS, O/seas Two Day

Phone Japan

W R Hamer ZL2CD, O/seas Seven Day

Phone NZ

G L C Jenkins VK3ZBJ, Two Day Phone

Section

A Van Derby VK2EDB, Two Day CW

Section

As the number of overseas entries were few all overseas entries will receive a certificate.

#### RESULTS OF 1982 ROSS HULL CONTEST

CALLSIGN	7 DAY		2 DAY	
	PHONE	CW	PHONE	CW
VK6KZ	76714	0	22330	0
VK3ZBJ	57060	0	19326	0
VK6HK	38928	0	11396	0
VK3YY	35905	0	10405	0
VK3ZHP	29976	0	8848	0
VK2BA	10628	0	3368	0
VK6OX	10198	0	3560	0
VK1VP	8490	0	3240	0
VK8GB	6044	0	3944	0
VK2EDB	5444	0	1812	970
VK4DD	4204	0	1218	0
VK6SM	3960	0	892	44
VK3VF	3420	0	1047	0
VK5KMW	2670	0	1200	0
VK3YRP	2384	0	1520	0
VK4ZTV	1594	0	544	0
VK2ZDX	1577	0	500	0
VK2KFJ	863	117	730	51
VK3ZHQ	187	0	0	0

#### OVERSEAS

JH1WHS	0	0	1350	0
JA2DDN	1800	0	0	0
ZL2CD	3500	0	0	0

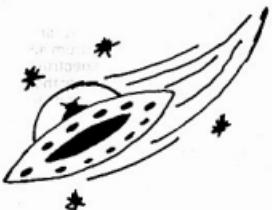
#### 1983 RTTY CONTEST

Further to the contest rules — page 64 April AR — Copies of Exchange Points Table are available from FCM at above address. Please enclose SSAE.

Reg VK1BR

AR

## SPACE



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at Box 300, Caulfield South Vic 3162 for  
price list and further information.

# BOOK REVIEW

Ron Cook VK3AFW  
7 Dallas Avenue, Oakleigh, Vic 3166

## 100 BASIC ELECTRONIC PROJECTS

### First Edition

This interesting book is published by the WIA (NSW Division) Education Service. It is based on an earlier book by Dave Wilson, VK2KDW, and incorporates additional material by Ian Hook.

Although it is a how-to-do-it rather than a who-done-it, I found it hard to put down until I had read it all. This is in spite of the title giving away the whole plot. Yes there are one hundred projects and although they are basic, they offer enjoyment and some education, I am sure, for all amateurs and short-wave listeners as well as all others, interested in electronics, aged from nine to ninety years.

Every project has a circuit diagram, a parts list, an explanation on what it does and how it does it and, where appropriate, sketches and descriptive information on construction. Some projects do not even need a soldering iron.

Just to whet your appetite here are the names of ten of the projects.

*Dr Who Maze*  
*Transistor Tester*  
*Dalek Bomb*  
*Electronic Thermometer*  
*One Transistor Receiver*  
*Hazard Warning Light*  
*144 MHz Sniffer*  
*BFO*  
*Metal Detector*  
*Brake Fluid Monitor*

And the best news is that the price is only \$3.00, yes 3¢ per circuit!

I strongly recommend this book and suggest you enquire at your local Divisional Office or Mag Pubs.

The review copy was provided by the WIA NSW Education Service. Their address is PO Box 262, RYDALMERE, NSW 2116 and copies could be obtained from them but don't forget the postage.

## MICROCOMPUTERS IN AMATEUR RADIO

By Joe Kasser, G3ZCZ

This is a sturdy paper-back book of over 300 pages. It is intended to show the amateur how he can use a mini-computer, based on a microprocessor, as a station accessory for receiving and sending Morse and/or RTTY, and for such operating assistance as log and record keeping.

Inevitably any such book must be heavily biased toward a particular microcomputer. Apart from the popular Apple, Tandy and Commodore, there are some one hundred commercially produced inexpensive microcomputers. This book is based on the GOLEM-80, an 8080, 8085 or Z80 based system using the AMS-80 monitor and an S-100 bus. The beginner will be relieved to learn that most of the buzz-words are explained in the early chapters.

Obviously if you build the GOLEM-80 Project you will want this book to get the most out of the beast.

As far as I can ascertain the programmes given in the book will run on most Tandy machines with an S-100 bus. Some modification to the software would be inevitable but there should be no problems with the hardware. Full software/programme listings are given at the rear of the book.

Even if you do not have an 8080 or Z80 based system this book should provide you with some good ideas.

Although the 100 plus pages of programme listings may take you a considerable time to type in, the cost of the book is much less than current prices for equivalent software packages.

If you are "into" microprocessors, or about to take the plunge, then this book is certainly worth considering.

By the way does anyone have any ideas on an S-100 bus for a ZX80/8k ROM?

The review copy was provided by Australian and New Zealand Book Co Pty Ltd, PO Box 459, Brookvale, NSW 2000. List price is \$15.95.

VK3AFW

AR

## EMC

(Electro Magnetic Compatibility)



If radio frequency interference is causing you a problem you are reminded that — "Advice on all types and aspects of interference (PLI, TVI, AFI, etc.) is available from the National EMC Advisory Service".

FORWARD DETAILS TO  
VK3QQ,  
Federal EMC Co-ordinator, QTHR.

# 1982 VK/ZL/OCEANIA DX CONTEST

## OVERSEAS RESULTS

Jock White ZL2GX  
NZART Contest & Awards Manager

### PHONE

ASIA	STH AMERICA	CW	ASIA	GW3MPB	649
JA1UOP 22050	JA6IP 6660	HK3NBB 1738	JA0DNS 40		
JA1AOD 1738	JA6GGD 3250	YV3BRF 11448	JA0TMF 27	HA5LZ	1805
JM1AFK 1644	JA6EFT 1248	YV2IF 1220	JA0NCE 12	HA0KDA	1300
JF1JLW 1630	JA6PGB 1030			HA8KAZ	600
JA1BN 1620	JA6CNL 585			HA3HZ	196
JR2VLS/1 1386	JA6JNG 580	OCEANIA	JA1HGY 1140	HA4XX	check
JH1PMH 1344	JA6DVO 280	K4COG/DU1 15066	JA1CJO 8811	VE3VC 3360	
JN1NDY 1330	JA6XD1 252	4H4SH 39560	JA1UPO 760	VE4MF 702	
JE1PJR 1140	JA6VVS 217	KH6IJ 240	JA1UO 4088	HASKDQ* 5010	
JK1TXS 1133	JA6DUD 198	KX6OB 13233	JH1LME 600	H45KKC* 3220	
JH1QLB 1092	JA6PB0 125	3020B	JE1PGW 594	H45KLG* 2185	
JA1AFF 1032		22386	JH1MTR 494	W1END 420	
J01LDY 968	JH7DNO 20736	P29CH	JN1WFF 352	HB9IK 5775	
JH10FA 836	JA7FFY 2280	15203	JA1AOD 324	HB9DX 492	
JA1AAV 708	JA7VSO 1422		JL1LJY 287	LZ1KSN 1938	
JA7ARW/1 650	JA7XBG 858	DL6RAI 714	JL1OSP 280	LA8MA 2121	
JA1DC0 648	JH7XGN 690	EA2IA 480	KC2X 336	LA4YW 1360	
JE1GBI 585	JA7FAS 400	E45CKP 224	W3ICM 243	LA8CE 1360	
JN10WG 252	JR7AMZ 210	E45CX 210	WA3DMH 203		
JA1AAT 224	JH7RXU 130	EA2OY 80	W5PWG 1200	PA0UV 114	
JA1JGP 208	JR7RHR 24	J2ASAP/1 30	OE1DSA/3 4464		
JH1KRC	JH7PWS	check	JL1EJO 24		
JA10HP 175		F8WE 546	JA1BNW 12	OE1DPA/3 4464	
JA1F0 80	JA8SW 1479	G3RRS 10792	JN1ENK 10	OH2BPE 4004	
JA1PUK 72	JH8BJG 1404	G3TR 3211	AA6EE 1764	OH2BAH 1520	
JL1EJD 56	JH8GQZ 1152	G5MY 1078	N6ZZ 1474	OH3TY 855	
JA1UPO 12	JH8NYK 957	G3YCP 378	JA1AAT 3	OH1PS 689	
J01RUB 2	JH8REF 800	H89IK 4264	JA1AFF 2	OH6RC 279	
JH1KRC	check	H89DX 450	K6VL 5611	OH2BHM 112	
JR2PV 13440	JA8UJY 711	L4AVG 2820	J2WB 2438	OK3ZAM 1500	
JA2BNN 7208	JH8JYV 68	I2AT 1100	W7OK 2900	OK1AMF 1116	
JA2APA 4416	JA9YBE 25756	I8SAT 620	W7DRA 2	OK1AWC 570	
JA2WB 4030	JH9GAT 2016	H3UU 1632	W8UVZ 930	OK1AWF 252	
JR2YKA 3978	J9AAYA 1000	L460CA 32	W9ATZE 50	OK1AXB 112	
JR2TRZ 1968	J9ARYL 216	PA0KDM 21	W0KEA* 12257	OK2BCI 24	
JA2YKR 1884	JH9FOI 3	OE1NPW/3 5152	JR3WXA 3792	OK1KZ 2	
JE2E0 549	JA0VHI 8745	J3AC0 342	STH AMERICA		
JE2KEB 200	JAOCOL 5236	H2BPE 2112	J3VKW 3975	OK2BW 928	
JR2AP 152	JHOLFE 1860	H3UU 1632	HK3NBB 3975	OK2ZKU 855	
JH2XTV 90	JAOFMB 1649	H6HI 18	J1EIQ 1518	OK2ZE 800	
JA2JRV 18	JR0AFG 940	H2BMM 18	J3BCT 24	OK2ZM 216	
JH3JYJ 17240	JA0TPE 730	OK1WT 6000	J4E5R 6538	OK1GRS 84	
JA3HTT 14910	JH0PIA 301	OK1AJN 2800	J4AMES 376	OK2RH 40	
JE3DYW 14440	JAOBFA 84	K3RJB 1710	J4ISK 70	OK2RE 1	
JR3SOT 4320	JA0DNS 12	OK2BJR 462	J4AQR 30	OK2RE 1	
JA3BLN 4224		K3CRH 144	J4A0R 30	OK2RE 1	
JE3KAM 2535		OK2ABU 102	J4A0R 30	OK2RE 1	
JR3WXA 2160		OK1KZ 18	J500H 4	OK2RE 1	
JA3UC0 1391			J58LF 2	OK2RE 1	
JR3CVJ 1150	OX32M check	028T 182	JR3WXA 3792	OK2RE 1	
JA36CM 423	VE4RP 3595	024MD 80	J46GU 5684	OK2RE 1	
JF3EGT 360	VE1YX 600	9H4G 110	J46BF 5134	OK2RE 1	
JA3HUL 180	VE3FEA 280		J46LLD 4960	OK2RE 1	
JH3SBL 23			J46CNL 533	OK2RE 1	
JR4BYH 4806	W1BIL 2046	SM4BTF 42	J46GGD 65	OK2RE 1	
JA4KWW 1236	N2LT 1880	SM6CNX check	J46RAI 1422	OK2RE 1	
JA4ESR 480	KC2X 710	YU1NR 1216	J47GLB 7665	OK2RE 1	
JA4NZ 363	W2KZE 84	YU7ADA 300	JH7DNO 6501	OK2RE 1	
JA4DEI 200		YU2KDE 30	J47XBG 760	OK2RE 1	
JH40JT 115	N4MM 1176	YU1RA 22	JH7NAB 594	OK2RE 1	
JE4GNF 80	W4WJU 1088	YU2LM 18	J47K 328	OK2RE 1	
JR4ISK 72	NSHH 6868		J47FAS 246	OK2RE 1	
JA4AQR 36		Y37XJ 1512	G5MY 2478	Y21PE 1640	
JAC5PO 4775	K6BPY 10676	Y34YC 882	G3XTJ 2415	Y22WF 108	
JAS5BSQ 3081	W6UA 3216	Y22WF 572	G3ESF 1071	Y35UB 16	
JH5EV0 1089	KA8CZS 64	Y24LA/3 240	J3PVA 576	Y24YH 60	
JH5CKV 910	W7OK 1680	Y24JX/3 135	J3KSH 270	Y24EA 8	
JAS5UIM 781	K07G 1392	Y25HL 120	J49YBA 11634		
JAS5DFY 610	W7PDE 216	Y23DG 80	J49KHU 32		
JH5OKF 384		Y21YK* 15228	J40DAI 12240		
JAS5XRF 198	W8UVZ 5797	Y22HF check	JH0BVA 680		
JAS6YAI 15504	K8VIR 860	Y22TO check	JH0ORW 400	Check Logs from: Y21FA, Y23CM, Y23TF, Y38VL, Y38YB, Y38ZF, Y42YG, Y47ZG, Y54UA, Y56XM, Y56ZM.	
JAS8LDD 12259	W8VEN 217	Y34RI check	JH0LFE 351		
JA6BIF 9835	W0KEA* 27552	Y38YE check	JH0PIA 60		

EUROPE	Y2-8883/P	2600
BR531976	5700	Y2-11030/F 1500
BR525429	2730	Y2-4406/G 952
HA2-013	1696	Y2-11148/F 374
HE9EVI	2070	Y2-16835/G 112
ONL-383	834	Y2-11153/F 2
NL4276	3144	Y2-16841/G 2
DE1-109976	384	<b>NTH AMERICA</b>
OH6-401	1200	WDX9 IK 1500
OK1-22309	6032	<b>ASIA</b>
OK3-26694	2176	JA6-9330/1 19800
OK1-11861	1962	JA1-24432 7704
OK2-19826	500	JA3-32103 3496
YD8-18318	546	JA3-5344 456
YU2-644	2832	JA4-30124 11088
YU7-713	960	JA7-8347 5046
YU7-606	912	JA8-3759 3250

## NOTES:

1 Certificates will be posted to top scorer in each scoring area (as per rules) and additionally to second and third place winners where activity warrants as well as band winner certificates where necessary. All certificate winners will receive this result sheet.

2 NZART expresses gratitude to all who submitted logs — sometimes even with quite a small score — thank you.

3 The certificates — showing a typical New Zealand bush scene, provided a difficulty with typing. Our apologies — a magnifying glass is desirable. I hope other factors will help to overcome this problem.

4 VK/ZL/Oceania DX Contest 1983 will be organised by WIA — the first two weekends in October as usual.

5 A reminder . . . NZART has a very comprehensive awards programme from the prestigious five band "5 x 5" award to WAP (Worked All Pacific) and many awards for contacts with ZLs such as NZ Counties Award etc.

AR

## WANTED

Due to the imminent retirement of Bob Arnold VK3ZBB a Contributing Editor for AMSATAUSTRALIA column is required.



# EDUCATION NOTES

Brenda Edmonds VK3KT  
FEDERAL EDUCATION OFFICER  
56 Baden Powell Drive, Frankston, Vic 3199

privilege of viewing and criticising as a way of checking the standard. Where I have been able to find fault, those faults have been rectified before the paper was reused.

On the idea of 'standard' — I look for questions that I would expect an average candidate to be able to answer after some thought. It is reasonable to expect that questions for AOCP exams require more knowledge than those for Novice exams. This may make them more complex questions, and it is probably these that the candidate remembers as 'trick' questions. There is a pattern to the exam paper — so many questions from each section of the syllabus — but at AOCP level I think it is fair to have some that connect two or three sections of the syllabus. For example, a question on TV1 could be related to the syllabus sections Interference, VHF, ATV, Filters and possibly even Harmonics. This is one reason why a well prepared multi-choice paper is much more searching than an essay type exam.

To those sitting for the May Novice exam — best of luck — but READ THE QUESTIONS — and take care when filling in the answer sheets. Also make sure that your answer sheet has your number on it.

For those of you who feel you have a genuine complaint about an exam, let me know the exam for which you sat, and the exam centre, and the reason for the complaint. Don't just say — 'it was a hopeless paper' see if you can specify the problem so I can check on it.

To those who again missed out in February, keep trying, many people have made several attempts and still got there.

I am trying to produce a sample paper about a month before each exam — let me know if you need a copy. The May paper is hot off the press.

Brenda VK3KT

## SPECIAL EDUCATION QSP



Brenda VK3KT has available:  
Trial Exam Papers —  
Theory, Novice, AOCP, Regulations.

Past CW Exams from DOC.  
10 Exams at 5 w.p.m.  
10 Exams at 10 w.p.m.  
10 Exams fill a C60 tape. Send a tape and I will copy what you want onto it.  
Complaints — or other comments — about Exam papers?

Make them known to your Federal Education Officer, VK3KT, QTHR, or on the Education Net, Wednesday evenings 12.00 UTC. 3.685 MHz±

# AWARDS

Mike Bazley VK6HD  
FEDERAL AWARDS  
MANAGER

8 James Road, Kalamunda, WA 6076

Once again the gremlins crept into the half yearly DXCC listings. Apologies to VK3DU who should have shown with a phone total of 282/284. Several awards this month to tempt the award hunter's appetite. These come from Brazil, Nigeria, France and Italy.

## DIPLOMA BRASILEIRO DE DX AWARD (DBDX)

### RULES

- 1 The DBDX award for confirmed contacts with a minimum of twenty different countries (one of them has to be Brazil), as shown on the Official DXCC List, is available to amateurs anywhere in the world.
- 2 Special stickers for additional countries, in groups of ten, will be available.
- 3 All contacts must be made on the 160, 80 and 40 metre bands. No cross-band or phone to CW contacts are allowed.
- 4 There will be two certificates; one for phone-CW operation and one for phone operation.
- 5 All stations must be contacted from the same call area, where such areas exist, or from the same country in cases where there are no call areas. One exception is allowed to this rule: where a station is moved from one call area to another, all contacts must be made from within a radius of 150 miles (240 kilometres) of the initial location.
- 6 All contacts must be "land stations". Contacts with ships, anchored or otherwise, and aircraft, cannot be counted.
- 7 Contacts may be made over any period of years from 15 November, 1945.
- 8 All confirmations must be submitted exactly as received from the stations worked, and minimum reports are: RS-33 for phone and RST-338 for CW.
- 9 The DBDX secretary will keep an honor roll showing all awards issued and consecutively numbered.
- 10 Applications must be submitted to:  
"LABRE Awards Manager — DBDX  
PO Box 07-0004  
Brasilia — Distrito Federal — Brazil  
— 70000
- 11 Decisions of the LABRE Awards Commission regarding interpretation of the rules as here printed or later amended shall be final.
- 12 Sufficient postage for return of confirmations must be forwarded with the application — US\$2.00 or 10 IRCs.

## WORKED ALL NIGERIA STATES AWARD — WNS

### CONDITIONS FOR THE AWARD:

Work ONE amateur radio station from EACH of the states of the Federal Republic of Nigeria. There are nineteen states in the

Federal Republic of Nigeria. These are:  
Lagos State and Federal Territory

Abuja	5N0
Ogun State and Oyo State	5N1
Kwara State and Niger State	5N2
Ondo State and Bendel State	5N3
Anambra State and Rivers State	5N4
Imo State and Cross River State	5N5
Benue State and Plateau State	5N6
Bauchi State and Gongola State	5N7
Bornu State and Kano State	5N8
Kaduna State and Sokoto State	5N9

## WORKED ALL NIGERIA ZONES AWARD — WNZ

### CONDITIONS FOR THE AWARD:

Work ONE amateur radio station from each of the ten call areas in Nigeria.

## OUTSTANDING NIGERIA DX AWARD — 5NDX

There are three classes for this Award:  
First Class: Worked 100 amateur radio stations.

Second Class: Worked 50 amateur radio stations.

Third Class: Worked 20 amateur radio stations.

Multipliers — NARS, President's Station (5N0AAJ), counts as five stations.

— XYL Stations, count as two stations.

— Club Stations, count as two stations.

For the three above awards all QSOs need to have been made after 1st January 1980. The Fee for each award is 10 IRCs or \$4.00. For each award, full QSO details are required and in lieu of the QSLs the log extract can be certified by the Federal Awards Manager. (This means that applicants forward a log extract, together with the QSLs to me — do not forget to include return postage for your QSLs — I will certify the list as being correct and this is then returned to the applicant who claims the certificate direct from the issuing society).

Applications for these awards should be sent to:

Awards Manager  
PO Box 2873  
Lagos  
Nigeria.

## DIPLOMA DE L'UNIVERS FRANCOPHONE (DUF)

This award may be claimed for having contacted (heard) and received QSLs from the DUF countries list.

There are several categories of this award.

DUF1: awarded for contacting five different DUF countries in three continents (five QSL cards). Fee — 7 IRCs.

DUF2: awarded for contacting eight different DUF countries in four continents (eight QSL cards). Fee — 9 IRCs.

DUF3: awarded for contacting ten different DUF countries in five continents (ten QSL cards). Fee — 12 IRCs.

DUF4: awarded for contacting twenty different DUF countries in six continents (twenty QSL cards). Fee — 15 IRCs.

DUF Medal: a very nice medal which can be claimed by the proud recipients of the DUF4. Fee — 20 IRCs.

All endorsements — 6 IRCs.

### DUF COUNTRIES LIST

#### EUROPE:

France

Corsica

Monaco

Andorra

French Army in Federal Republic of Germany

#### AFRICA:

Algeria

after 1 July 1962

Tunisia

Morocco

Central African Republic after 13 August 1960

Congo after 15 June 1960

Ivory Coast after 7 August 1960

Benin after 1 August 1960

Republic of Guinea after 1 October 1958

Mali after 20 June 1960

Mauritania after 20 June 1960

Niger after 3 August 1960

Senegal after 20 June 1960

Chad after 11 August 1960

Upper Volta after 5 August 1960

Cameroon after 1 January 1960

Togo after 27 April 1960

Djibouti after 14 October 1958

Malagasy Republic after 5 July 1975

Mayotte after 5 July 1975

Comoros after 25 June 1960

Reunion after 25 June 1960

Gloriosia Island after 25 June 1960

Tromelin after 25 June 1960

Europa after 1 August 1968

Juan De Nova after 25 June 1960

SOUTH AMERICA:

French Guiana after 25 June 1960

NORTH AMERICA:

St Pierre — Miquelon after 25 June 1960

Mauritique after 25 June 1960

Guadeloupe after 25 June 1960

Saint-Martin  
Saint-Barthelemy  
Clipperton  
Vietnam  
Khmer Republic  
Laos People's Democratic Republic

OCEANIA:  
New Caledonia  
Loyalty, Belep, Huon, Pins Islands  
Cherterfield, Walpole, Hunter, Maltev  
Wallis

Futuna  
Vanuatu  
Windward Group (Tahiti)  
Leeward Group (Utrera)

Australia (Tubual)  
Australia (Rapa)  
Marquesas  
Gambier

Tuamotu  
AUSTRALIA AND ANTARCTICA:  
Adely Land  
Kerguelen  
St Paul-Amsterdam  
Crozet

The usual certification rules apply (detailed in the Nigerian award above) and application should be sent to:

Mr Edmond DuBOIS, F9IL  
BP 7  
Aubencheul Au Bac  
F 59265 Aubigny Au Bac  
France

#### DIPLOMA DEL MILLENARIO

On the occasion of the Millenary of the foundation of the city of Udine, the Committee responsible for the organisation of the Electronic Exhibition EHS in collaboration with the ARI Section of Udine, institutes certificate "Diploma Del Milenario".

The certificate is granted to all OMs, YLs and SWLs all over the world who, in the course of 1983 will score at least thirty points according to the following regulations:

- 1 Each QSO/HRD with stations located in Friuli Venezia Giulia region (IV3 prefix) will count one point.
- 2 Each QSO/HRD with stations of members of ARI Section of Udine will count three points.
- 3 Each QSO/HRD with stations located in Udine, Buia, Fagagna, Brazzacco, S Margherita del Grugno will count six points.
- 4 Each QSO/HRD with the special station operating on the premises of

the sixth EHS exhibition on 8th and 9th October, 1983 will count ten points.

One station cannot be worked more than once on the same band, and contacts via transponders, repeater, and mixed mode are not considered valid. The operating modes are: SSB, CW RTTY, SSTV and shall be made on all the authorised bands, between 1st January and 31st December, 1983.

A special classification will be reserved for the OMs all over the world (excluding IV3 call signs), whose original, direct or indirect is Friuli, who score the most points. All the operators outside the IV3 call area will indicate on the log, the name of their original village in Friuli region.

A copy of the log with all QSO/HRD details to ARI Udine Diploma del Milenario PO Box 23-33100 UDINE, ITALY before 29th February, 1984. The award is free of charge. All participants will be sent a small flag as a keepsake of the competition. The decision of the jury will be final.

Well that's it for this month.  
73 es DX, Good Hunting de Mike, VK6HD.

AR

## TECHNICAL CORRESPONDENCE

### STATIC CHARGES

25/3/83

The Editor,  
Dear Sir,

Reading the letter by P Christie (VK2ATE — AR, Vol 50, No. 1, Page 41) and the column "When is a static charge present" (AR, Vol 50, No 10, Page 49) prompted me to write this letter concerning my own experiences with static charge.

These occurred during 1982 whilst I was stationed at Mawson base in Antarctica. I found that it was sometimes fatal to leave solid state receiving equipment connected to antennas during blizzards which occur frequently in Antarctica.

This was exemplified by operating a satellite navigation unit during such a time. The 400 MHz antenna assembly unit about one metre in height was located about five metres above ground. After several weeks of successful operation, the console unit failed only a couple of hours after the commencement of a blizzard.

Subsequent examination showed that the switching power supply board ceased to function. In order to run system self diagnostic routines to check the receiver board, signal processing board etc a temporary external power supply had to be bootstrapped to the system.

The diagnostics indicated faults on the CPU board (which contains many CMOS ICs) which in retrospect was not surprising since these chips have ESD susceptibility ratings of only 250 to 300 volts. The actual voltages on the coaxial cable connecting the console unit to the antenna must have

been in excess of 5000 volts since sparks could be seen when placing the cables coaxial connector near a grounded object (ref AR, Vol 50, No 10, Page 49). I was somewhat surprised however that the RF front end section did not fail also. At \$1700 for two replacement circuit boards this is not an exercise to be repeated!

A second example of the high static charge buildup on antennas was observed between the mounting brackets of a 600 to 50 ohm balun mounted on a wall in the amateur shack at Mawson about 5 mm from an earthed copper pipe nearby. With a frequency of about 1 Hz, large blue-green sparks were clearly seen jumping between the balun and the pipe. A sharp crackling sound was also evident coincident with the sparks. A fluorescent tube held close to the arcing was also seen to illuminate.

Other cases of electronic component failure during blizzards which were connected to the outside world by wires or antennas were also reported during the year. The QRN levels are typically S9 or larger during blizzards, effectively making radio operating impossible.

I believe that the effect Mr Christie and myself have observed results from the action of rapidly moving dry particles colliding with antenna wires, leaving the wire charged. In our cases it was dust and snow respectively.

The same physical process occurs when a comb is brushed through dry hair.

Yours faithfully,

Brian Jarvis VK0DX/VK7XD



### HISTORY OF THE RAAF WIRELESS RESERVE

The RAAF Wireless Reserve was created about 1931 by Howard Love (then VK3BM), President of the WIA Victorian Division and the Air Board of the RAAF.

It was realised that the radio amateurs of Australia represented a great potential of emergency communications to the RAAF in providing a group of trained signals operators. At the outbreak of the 1939/45 war some 200 operators were called up for full time active service from all States.

The Air Force appointed Bob Cunningham VK3ML, with the rank of Pilot Officer to command and organise this Reserve. Bob now wishes to write a history of the RAAF Wireless Reserve from information available. Unfortunately there are many missing gaps in the 1931-1939 years where records of members and their activities are unavailable. He would therefore be grateful if former members of the Reserve would provide him with known lists of members and any items of interesting activities worth recording in the proposed history.

Please forward any such information to VK3ML at 384 Glenferrie Road, Malvern, Vic 3144.

AR

# NATIONAL EMC ADVISORY SERVICE



Tony Tregale VK3QQ  
FEDERAL EMC CO-ORDINATOR  
38 Wattle Drive, Watsonia, Vic. 3087

## THE RADIOCOMMUNICATIONS BILL — EMC COMMENT

The Radiocommunications Bill has at last seen the light of day; for how long — who knows! Governments consider electronic communications to be very low priority. This is rather surprising considering they use the electronic form of communication to conduct a large percentage of their everyday business.

The draft Bill has given a great deal of general attention to the problems of interference. Unfortunately it appears to be written in a form which is not too helpful in respect of the major interference problems affecting the Amateur Radio Service.

There are many members of amateur service who can boast that they have never received a complaint of interference, however I guess there are few members who boast that they have never been troubled with interference to their reception.

Those members of the amateur service who have never received a complaint of interference — excellent! They should consider themselves very lucky in this fast expanding world of electronic gadgets. However, because the Amateur Radio Service has always kept well ahead in modern technology the lack of interference complaints can mean only one of two things:

(a) the Station is separated from other radio and electronic equipment by a large amount of real estate, or  
(b) other radio and/or electronic equipment which is in close proximity to the station has, by good luck or design, a reasonable immunity factor.

Most amateur stations have installed equipment which uses the most modern communications techniques, equipment which meets high standards for transmission and reception of electromagnetic energy.

The same cannot be said for manufacturers of domestic entertainment equipment and consumer products where the object is to produce a product as cheaply as possible, to ensure a large turnover with as much profit as possible with little regard to how it will operate when it is in close proximity to other equipment — which of course is the case in the majority of domestic situations.

This lack of regard for how and where the equipment will be used is reflected in the fact that a large percentage of domestic entertainment equipment and consumer product is manufactured in overseas countries and dumped on the Australian market by profit orientated entrepreneurs.

The majority of radio amateurs are not in

the fortunate situation where they can isolate themselves with large amounts of real estate. For most of us 'luck' runs out and we receive a complaint of interference or suffer interference soon after receiving our hard earned licence.

Quite often there is no simple answer — except to completely redesign the domestic equipment so it has a reasonable immunity factor and does not produce incidental radiation. Also, redesign the electrical power distribution so this does not produce incidental radiation.

No member of the Amateur Radio Service can, with respect, sit back and ignore the ever growing threat to our service by interference problems which are not of our making, in many cases are beyond our control and, are outside the laws as it stands at present.

The draft Radiocommunications Bill goes some way towards dealing with the problems of IMMUNITY/SUSCEPTIBILITY and INCIDENTAL RADIATION. However, much work will be required before full and proper control is able to be exercised over these problem areas.

Before commenting on the interference sections of the Bill perhaps we should outline a few items from some of the original material.

The Draft Principles of Proposed Radiocommunications Legislation by the Department of Communications dated January 6, 1981 stated: "Control of interference should be possible including incidental emissions from non-communications sources such as radio frequency, heaters and power lines."

"Standards: The Minister could be empowered to adopt standards relevant to use and technical factors."

"Radio equipment should be subject to technical standards."

"Restrictions should be imposed, to the limits of Commonwealth legislative power, to control manufacture, importation and sale of equipment which fails to meet those standards."

The Institute responded with a twenty two page document entitled, "Proposed Radio Communications Act — Comments submitted on behalf of the Wireless Institute of Australia".

### STANDARDS

It is noted that the draft principles include the suggestion that the Minister could be empowered to adopt standards "relevant to use and technical factors". It is not clear what that phrase means.

In general, such a provision is supported. However, two observations are made. Firstly, it is suggested that this power should not reside in the hands of the Minister. It would be more appropriate for standards to be prescribed by regulation. The prescription of standards by regulation is provided for by the Trade Practices Act 1974 and such a course has considerable advantage. A standard promulgated by regulation, or identified by regulation, is far more accessible than what really amounts to an internal administrative Act. Secondly, a regulation is necessarily more formal and there is thus less chance of an inappropriately worded standard being promulgated. Finally, a Regulation is subject to review, and may be disallowed. It should be noted, in the context of standards, that type approval is presently not required in respect of equipment used by the Amateur Service. As is demonstrated at the outset of this paper, the essential characteristics of the Amateur Service that distinguish it from other Services, certainly would make the application of such standards to that service totally inappropriate.

Insofar as the provision relates to standards relevant to use, the Amateur Service has proved its own capacity to determine its own usage of its bands through its own organisations and by the achievement of consensus. It is essential that any power (as here suggested to make Regulations) should be expressed in terms that clearly enable all standards to exempt stations in a particular Service or particular classes of stations in a particular Service.

It is also noted that a suggestion is incorporated in the draft principle paper to the effect that public comment on drafts should be sought except in cases of urgency. This is seen as a very constructive and worthwhile proposal and indeed it is suggested that this proposal could be taken further. Not only standards but regulations affect investment decisions and individuals. The regulation of radio communication is necessarily complex. The WIA favours the

public exposure of not only draft standards but also draft regulations prior to their promulgation.

An interesting precedent is to be found in Section 70 of the New Zealand Commerce Act. Under the legislation regulations will, in the normal course, be exposed for comment though a discretion is given to bypass the public exposure route where it is urgent for a move to be made quickly.

Because of the importance of this area, it is worth quoting an extract from the New Zealand Securities Act. Section 70 of that Act gives to the Governor-General power, by Order in Council, "in accordance with the recommendations of the Commission," to make regulations for certain specified purposes and provides by sub-section (3): "before making any recommendation for the purposes of" this Section "the Commission shall —

- (a) do everything reasonably possible on its part to advise all persons and organisations, who in its opinion will be affected by any order in council made in accordance with the recommendation, of the proposed term thereof, and give such persons and organisations a reasonable opportunity to make submissions thereon to the Commission; and
- (b) give notice in the Gazette, not less than fourteen days before making the recommendation, of its intention to make the recommendation and state briefly in the notice the matters to which the recommendation relates; and
- (c) make copies of the recommendation available for inspection by any person who so requests before an order in council is made in accordance therewith;

provided that this sub-section shall not apply in respect of any particular recommendation if the Commission considers that it is desirable in the public interest that the recommendation be made urgently; provided also that failure to comply with this sub-section shall in no way affect the validity of any order in council made under this Section."

The Wireless Institute of Australia regards the inclusion of such a provision, appropriately modified, as highly desirable.

At present the Amateur Service is subject to the provisions of any condition imposed by way of licence, the provisions of a Handbook which purports to interpret the Regulations made under the Wireless Telegraphy Act (though not necessarily consistently in all cases), the Regulations themselves and finally the Act. The present inconsistencies and inadequacies have resulted in the expenditure of an enormous amount of departmental and individual time in the resolution of various problems that arise. Many of these difficulties would never have arisen had there been proper consultation before the promulgation of the relevant Regulation. Certainly the "Handbook" has been the subject of close co-operation between the Department and representatives of the Amateur Service and experience of this co-operation is clear evidence of the desirability of prior consultation. No doubt other users of the radio frequency spectrum would take a similar view.

### Interference

It is noted amongst the principles announced in general in the paper prepared by the Department it is suggested that control of interference should be possible, including incidental emissions from non-communication sources such as radio frequency, heaters and power lines.

The power to control interference may be regarded as an essential aspect of the control of radiocommunications. However, there are considerable difficulties in the establishment of appropriate principles and in the definition of powers that are appropriate. Two broadly based principles can be identified and may be summarized as follows:

- (a) *A sub-standard, improperly operated, or defective, or inadequately designed receiver, entertainment device, or other device susceptible to RF interference should not be protected from a transmitter that is correctly operated, correctly adjusted, and meets a reasonable harmonic and spurious emission standard.*
- (b) *Radiocommunications Services should be protected from interference and from unnecessary electromagnetic radiation emissions of any source.*

A blanket prohibition against causing interference imposed on particular stations, classes of stations, or stations in a particular Service, must be rejected. The formulation of principles must necessarily have regard to the fact that the removal of interference may be only possible at the receiver or device suffering the interference. This may involve some expenditure and it should be clearly established how that cost is to be borne.

It must be recognized that in some cases interference cannot be remedied at the transmitter. For example, a transmitter correctly operated, and of a high standard, may cause inevitable interference to a broad band device in the immediate vicinity, even though that device is (by industry standards) reasonably protected against RF interference. Where special measures are necessary in such cases, the question as to who is to bear the cost may give rise to a different answer. At least it should be made clear, in such cases, that a person who complains and then unreasonably refuses to allow the necessary measure to be taken, can preserve no rights.

It is considered that the legislation should establish certain broadly based principles to deal with these situations.

So far as a power of general control is concerned, it is noted that in the United States the Federal Communications Commission is, by Section 302 of the Communications Act 1934, given the following power:

- (a) *The Commission may . . . make reasonable regulations governing the interference potential of devices which, in their operation, are capable of emitting radio frequency energy . . . in sufficient degree to cause harmful interference to radio communications. Such regulations shall be applicable to the manufacture, import, sell, offer for sale, shipment or use of such devices.*
- (b) *No person shall manufacture, import, sell, offer for sale, ship or use devices which fail to comply with regulations promulgated pursuant to this Section . . .*

The Institute is of the view that this is an area where regulations (of the kind discussed in the context of standards) are appropriate and the effectiveness of such regulations would be bolstered by the provisions of the Trade Practices Act 1974. Recourse to heads of Commonwealth constitutional power such as the corporation power and the customs power as well as the postal, telegraphic, telephonic and like services power, may be necessary to make Commonwealth legislation in this area effective.

There are many EMC areas within the new draft Bill which have been considered by the CASPAR Committee and are now contained within the CASPAR Report. This report will assist the Federal Executive with the production of the Institute's official response to the Bill.

However, perhaps the most important outstanding omission in the EMC area is that the Bill refers only to receivers, it is by no means clear that the Federal Parliament would have the power to legislate for standards of immunity from the electromagnetic energy in items like audio systems, video systems, intruder alarms, intercoms, and other sundry consumer products.

This appears to be a most difficult area from the legal viewpoint. There seems no way in which radiocommunications legislation can cover non-communications equipment, even though this type of equipment and its problems are related through electromagnetic energy.

Unlike many other countries who have managed to deal effectively with equipment which is not intended to receive electromagnetic energy, it seems the Australian Federal Legal system (under which the DOC operates) is unable to cope with this situation and must, for the legislation to go through, involve the States' legal system — and all the problems this could involve.

So, unless some of our smart lawyers can think up an easy way around this difficult and growing problem area we will all continue to suffer the crazy situation where domestic entertainment and consumer products, which for economic reasons, come with built-in poor immunity factors and cause so much trouble to the Amateur Radio Service.

In respect to Standards the Bill indicates it should be the radiocommunications equipment which should meet specific standards. This is of course against the whole concept of the Amateur Radio Service.

In contrast to the field of business and commercial (taxi, fire, Police, and general business) communications; with amateur radio it is the operator who is technically qualified and licensed on those technical qualifications.

With business and commercial communications services it is necessary for the equipment to meet specific standards because, in the main, the operators are unqualified and do not hold licences based on any technical qualifications.

In conclusion it would seem the most obvious answer which would solve the Standards situation for both Services would be for the basic requirement of Standards to cover EME (electromagnetic emission): A Standard to cover the transmission or reception

tion of a specific class of emission (this would need to be little more than we have now). However, the advantage to the amateur service would be that television receivers and the like would be required to meet an emission receiving standard for their class. As with business and commercial communications the television receiver is operated by non technical or qualified operators; therefore it would be the responsibility of the manufacturer or importer to ensure that the equipment would meet these emission standards. The technically qualified and licensed operators within the amateur service would, of course, be personally responsible for their emission standards. Therefore there would be no question of equipment standards or type approval of any equipment used within the Amateur Radio Service.

## MAGAZINE REVIEW



**CQ JANUARY 1983.** New York City Marathon (G). Experimental antennas for fifteen metres (P).

**RADIO COMMUNICATION MARCH 1983.** Portable two metre J pole (P). RSGB General Meeting (G). CW Filter (P). 3.4 GHz Preamp (C).

**73 MAGAZINE MARCH 1983.** RTTY Tuning Indicator (C). Adventure in Sarawak (G). Oscar 8 Telemetry (T). High Q cavity filter (C).

**73 MAGAZINE APRIL 1983.** Electronic Mailboxes, Amateur radio's new method of

Roy Hartkopf VK3AOH  
34 Toolangi Road, Alphington Vic 3078

communication (P). Suppressing alternator whine (P). Mount for a mobile rig (P).

**HAM RADIO FEBRUARY 1983.** Panoramic Adaptor design notes (G). Bragg Cell Receiver (G). 2304 MHz Low Noise Preamp (P).

**QST JANUARY 1983.** Modern Receivers and Transceivers (G). Beverage antennas (T). Century Club Awards (G).

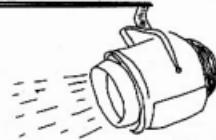
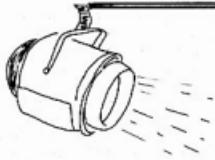
(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical.

AR

## SPOTLIGHT

ON

**SWLing**



Recently, I was present at a Launceston SWL's OTH, after we received a tip-off from some DXer's in New Zealand, when we heard one of the rarest stations in the world — the Falkland Islands Broadcasting Station. One moment, the channel was quiet, then popped up some very weak audio, indistinct, with quite an amount of flutter. The programme consisted of mainly "pop" and disco music, although we recorded the audio to get the announcements, which were clearer on playback.

Ordinarily very difficult to hear in Australia, across the Tasman they seemingly have better propagation than we do. However, many SWLs in southern Australia were indeed very fortunate to intercept the FIBS. After the tip-off, many commenced monitoring 3.958 MHz, which appears to be the main operational frequency, and the signals faded in at about 0900 UTC. The phenomenon of hearing signals from this region only occurs at the Autumn equinox of March, when the Sunrise/ Sunset is roughly parallel, although the Spring equinox does not propagate as well. Signals come over the South Polar region, hence the flutter which usually is present from the Antarctic region. By the time you will be reading this, the peak will have well and truly passed. In fact, they went off Daylight Saving the same weekend as we did here in Tasmania, which means they would open one hour later at 1000 UTC, when signals from Asia commence to come in.

I believe that the MW as well as the transmitter formerly on 2.370 MHz were either destroyed or damaged during the war last year. One interesting observation is that they are using SSB with carrier, as the audio is present on the upper sideband, but not on the lower. This could be indicative of a Services' transmitter being

used. As well, a lot of the programming is from the British Forces' Broadcasting Service, serving the British garrison which now makes up two thirds of the population. There is reportedly an FM transmitter operational.

Congratulations to those fortunate in hearing the FIBS and many reports from Australia and NZ have gone in, judging by some cheerios I heard from the DJ. It is unfortunate that listeners in WA and further north in NSW would have missed out hearing this station, because the difference in propagation makes it highly improbable.

Recently, I accidentally came across some cordless telephone outlets between 1.7 and 1.9 MHz. Now I don't have anything against these devices, but am somewhat concerned that one could lose contact on 1.810 MHz CW because a local cordless phone will suddenly plop on to the channel out of nowhere. Surely other frequencies exist for these devices to operate without causing harmful interference. They state on the commercials they are Telecom approved but surely the user would have to apply to DOC for permission to operate. If any cordless systems are heard within our primary allocation on 1.8 MHz I shall be reporting them to the Intruder Watch. It does appear to be one model of these devices that could cause problems.

Listening on 6.095 MHz recently, I thought I had come across a new frequency of a Chinese domestic network. However, I was puzzled because the music choice didn't follow the normal pattern of what one hears from the Central Peoples Broadcasting Station (CPBS). The identification and the time signal were similar to that on the CPBS. Yet it eventually dawned on me, after listening for a while, that it was

Taiwan. The signals are directed to the Chinese mainland, and it is naturally in that language. There doesn't appear to be any jamming yet. Listen at 1100 UTC and see for yourself.

And talking of new channels, both Radio 3RPH and VL2UV altered their operational frequencies in the second week of March. The Radio Print for the Handicapped Station 3RPH, formerly on 1.705 MHz, can now be heard on 1.629 MHz. The University of NSW station, VL2UV, has now gone to 1.692 MHz from 1.750 MHz.

Those interested in shortwave listening may not know that there is a regular weekly amateur radio net devoted to this. It is on Thursday evenings at 1030 UTC on 3.565 MHz ± ORRM LSB. Net Control is either Don VK3BMB, Tony VK2ECB, or myself VK7RH.

Don't forget that the "J" period commenced on Sunday 1st May. On this date, international broadcasting stations occasionally alter their frequencies to take account of seasonal variations in propagation. This period will be in effect until the first weekend in September, when it becomes the "S" period. Also winter time propagation will be in effect now. Many signals will be heard during daylight hours, especially on 25 and 31 metres, which should have twenty four hour propagation.

Also take note of signals coming across the South Polar regions, emanating from Europe. Listen on 41 and 49 metre bands at 0200 UTC for DW, Radio Berlin International and the BBC, mainly in Spanish. Those in the southern states again have the advantage over those further north in observing these.

Well, that is all for this month. Until next time, the best of 73's and good DXing!

— Rob

AR



# VK4 WIA NOTES

Bud Pounsett VK4QY

33 Lasseter Street, Kedron, QLD 4031

## Geoff Adcock, VK4AG — MERIT BADGE AWARD

That very popular amateur, Geoff, VK4AG, has been in the limeight again. It was president, Guy Minter's, VK4ZXZ, pleasure to present a merit badge and certificate to Geoff for his untiring work and many achievements in furthering the cause of amateur radio in Queensland. The merit badge is an award not lightly given and does not happen very often. Geoff is always there to assist his fellow amateur in any way that he can. He is very active in WICEN and has built a couple of VHF repeaters for portable use. Geoff was largely responsible for the technical side of one our state's greatest achievements, that of putting on the air, the games station, VK40CG. He is active in the amateur radio side of scouting, not only at JOTA time, but at many other times throughout the year. Geoff also takes an active part in the broadcast on Sunday mornings relaying VK4WIA on ten metres. Geoff, VK4AG, can wear his merit badge with pride, Queensland is justifiably proud to honour VK4AG in this way.

to commission new equipment for their repeater, VK4RDD. This equipment was made possible by a legacy from Arch Marshall, VK4AF, 1907-1982, late of Clifton. It will be known as the Arch Marshall Memorial Repeater and will carry a plaque commemorating Arch's generous bequest.

Plans are well advanced for a repeater on a mountain top north of Roma. It is anticipated that the site will afford a very wide coverage. "On the Air" day is not yet available but this repeater is not too far off.

## EDUCATION

We have already had one "Educating the Educators" seminar in Queensland, last year in Toowoomba on the Darling Downs. This year two more are planned. Ron Smith, VK4AGS, from Dalby will be teaching the teachers the finer points of teaching. At press time, nothing is definite, but it is hoped to hold one in Townsville on the weekend of 28/29 May, to be followed by one in Central Queensland, probably Rockhampton, on 10/11 September.



Guy Minter, VK4ZXZ, Queensland State President, presents the Merit Badge and Certificate to Geoff Adcock, VK4AG, at the February General Meeting in Brisbane.

## REPEATERS

Gladstone Amateur Radio Club have officially opened their 2 metre repeater on CH6900. This repeater, situated on Amy's Peak some 1000 metres ASL, has a range of about 150 km. It covers Highways 1, 17 and 39, the Capricorn Coast, many off shore Barrier Reef Islands, Gladstone, Rockhampton, Biloela, Monto, Moura. The repeater, completely solar powered, is located about 25 metres above ground, some 60 km south west of Gladstone on the Calliope Range.

The Darling Downs Radio Club are about

## RTTY NEWS

More and more stations are becoming active on RTTY, particularly in south east Queensland. The SEQ Teletype Group now have a news broadcast on Monday evenings on 10.120 MHz at 1000 UTC. The Bulletin is also carried by the group's Mt Cotton 2 metre repeater near Brisbane. The group would welcome reports on the 30 m transmission.

## HISTORY

There are two historians in Queensland.

Peter Brown, VK4PJ, has been collecting history up to 1930 for some time. Now Al Shaw Smith, VK4SS, (Thumbnail Sketch, April AR) has taken on the task of recording events and personalities of the 1930 to 1939 years. Al has set out to document all those with VK4 callsigns in that decade. Maybe you can help, both Peter and Al would appreciate any help that they can get, both are OTHR.

## THE QUEENSLAND AWARD

The VK4 Council have decided at the last council meeting to delete two shires from this award. These are Mornington and Arakun Shires. Both are aboriginal reserves and not accessible without special permission from the appropriate government department. So that you can advance your score towards claiming the Queensland Award, the Queensland net operates each Thursday evening on 3.605 MHz, 0930 UTC. You do not have to operate from the Sunshine State to join the net, others less fortunate than we Queenslanders are very welcome.



## STOLEN EQUIPMENT

Recently GFS Electronic Imports in Mitcham, Vic were the victims of a burglary — their second in as many months.

Equipment taken in these robberies were:

A PCS-3000 Azden two metre FM rig — serial number 80256

A Standard C58E two metre portable rig — serial number E030036

A JIL-SX200 scanner — serial number 10740326

FS10 pocket scanner — no serial number

C800 pocket scanner — serial number F050332

Sky Ace R517 pocket receiver — no serial number.

Anyone offered equipment similar to that described above are advised to carefully check the serial number and if the serial number is the same or has been erased, contact Greg Whiter of GFS or your nearest Police station.

Apparently other traders in the same area have had similar experiences and as a result of these burglaries Greg has improved security at his premises.

AR



# VK2 MINI BULLETIN

Athol Tilley VK2BAD  
VK2 MINI BULLETIN EDITOR  
PO Box 1066, Parramatta, NSW 2150

## COUNCIL REPORT

The VK2 Divisional Council met on the 11th of March at the WIA Parramatta office.

An invitation from the Queensland Division for a VK2 representative to attend the VK4 Radio Club Workshop in April was accepted. Councillor Peter Jeremy, VK2PJ, will attend so he can observe the operation of the workshop system. An agenda item carried at the 7th Conference of Clubs requested the VK2 Council to investigate the radio workshop system with a view of changing the twice yearly conference to an annual meeting along the lines of the VK4 club workshop system. The division appreciates the generous offer by the Queensland Division to arrange the accommodation and meals of the VK2 delegate.

Twenty-five new applications for membership were received and accepted.

The official opening of the Parramatta office was discussed and the date confirmed as being the 28th of May at 2 PM.

A report was presented on preparations for the Annual General Meeting. Special thanks are due to Bob Clark VK2YOD, Bruce Miller VK2VRG, Tom Delandre VK2PDT and Jim Swan VK2BQS who answered a call on the broadcasts and assisted councillors in inserting and posting the notice for the AGM.

Eight agenda items were received for the 8th Conference of Clubs. A report of the Conference will be included in the next VK2 Mini Bulletin.

Federal Councillor Stephen Pall VK2PS presented a report on WIA Federal matters and correspondence. It was resolved that the division pay the air fare of the Federal President so he could attend our official opening.

## REPORT ON 1983 ANNUAL GENERAL MEETING

The Annual General Meeting of the division was held on the 26th of March in the auditorium of the Granville RSL Club. Fifty-eight members and two visitors attended the meeting commenced at 2 PM.

The minutes of the 1982 AGM, President's Report and Annual Accounts were all received and adopted by the meeting as circulated. A motion of special thanks to retiring members of council, Athol Tilley VK2BAD and Stephen Pall VK2PS was carried by acclamation.

Awards were then presented to winners of the 1982 Homebrew Competition. Winner of Completely Home Designed and Built section, Graeme Dowse VK2CAG, was presented with an engraved trophy, a cheque for \$100 and an open order on the division for \$50 for his fine entry of a 2 metre repeater. Geoff Campbell VK2ZQC was presented with a merit certificate and a \$25 open order for his entry of a 6 metre power amplifier in the home built from a



L to R: Graeme Dowse VK2CAG, Geoff Campbell VK2ZQC and Tom Taylor VK2DTB.

published design section. The awards for Mike McDonnell VK2DAI and Rod Pym VK2DNP will be posted to them as they were unable to attend the meeting.

Presentations were also made to winners of the 'Amateur Radio' Technical Articles Award, these being judged from articles from VK2 members published in Amateur Radio magazine during 1982. First was Bruce Henderson VK2DFH for his article "Antenna Tuner Adjustment" published in March 82 AR. Bruce's award of a cheque for \$200 and a merit certificate was accepted on his behalf by Tom Taylor VK2DTB who has assisted with the development of the tuner described in the article. Second prize of a cheque for \$100 and a merit certificate will be posted to Terry Clark VK2ALG for his article on a CMOS bug published in February 82 AR.

Third prize was awarded to Gordon McDonald VK2ZAB for his article "Staggered Stacking" published in the June 82 AR, and his cheque for \$50 and a merit certificate will be posted to him as he was unable to attend the meeting. Rod Pym was highly commended for his article on "Another 2 metre amplifier".

The Returning Officer, Roger Henley VK2ZIG, then announced the members of the 1983/84 Council. As there were only six nominations, no ballot was required, and the new council members are Susan Brown VK2BSB, Bob Clark VK2YOD, Peter Jeremy VK2PJ, Tim Mills VK2ZTM, Jeff Pages VK2BYY and David Walters VK2AYO. The meeting then debated and voted on the four notices of motion as sent to all members of the division. The two special resolutions to change Articles 93 and 96 were carried without dissent by the meeting and are now in effect as prior approval from

the Attorney-General had been received for the changes. The third motion asking that the Administrative Secretary check whether QSL cards are awaiting members at the office was lost. The final motion requesting that divisional premises at Wigram Street, Parramatta be made available for meetings by bodies of kindred interest to the Institute was lost.

Roger Henley VK2ZIG was reappointed as the Division's Returning Officer for 1983/84 and the meeting then closed at 3.23 PM.

The following articles (93 & 96), as accepted at the 1983 AGM are now in effect. Please amend your copy of the Articles of Association.

"Article 93. Each delegate shall, at any such Conference, have voting rights on behalf of his club, in respect only of those members of his club who are also Ordinary Members of this Division, in accordance with the following scale:

(a) For any number of Ordinary Members of this Division from five (5) to ten (10) inclusive — one (1) vote.

(b) Thereafter, for each subsequent group, or

part thereof, of ten (10) Ordinary Members of

this Division — one (1) vote.

In calculating the number of votes to be exercised by a delegate at any Conference, any Ordinary Member of the Division who is a member of more than one club shall be counted in respect of one club only for the purpose of calculating the voting rights of a delegate. Where an Ordinary Member of the Division holds membership in more than one club, such member shall be deemed to have assigned his voting rights to the club nearest his home address unless he advises the secretary of the Division and the clubs involved of his contrary wishes in writing. The secretary of the Division

shall keep a file of such members which shall include the club to which the member is assigned for the purposes of voting rights."

"Article 96. A Conference may not transact any business unless a quorum of no less than twenty five (25) per cent of the total clubs affiliated is represented by delegates entitled to vote".

(Prior approval for changes to Articles 93 and 96 has been obtained from the Attorney-General and the Corporate Affairs Commission.)

## REPEATER REPORT

There has been considerable activity during the last few months in developing new repeater systems in VK2.

A few weeks ago eleven new licences were issued by the Department of Communications. Expanded details will be given on future divisional broadcasts and in the MINI BULLETIN. Some of the new systems included VK2RRT (6900) in the Condobolin region, VK2RCG (6800) at Dubbo and VK2RNE (6950) at Glen Innes. To provide a channel for Glen Innes, the existing Moree-Inverell service VK2RMI will change from channel 6950 to 6650.

In Sydney, VK2ROT which is sponsored by the OTC (A) Amateur Radio Club, was installed in the Eastern Suburbs on channel 7075. A new paging system has been installed in Sydney just above 148 MHz and this appears to be interfering with this new repeater. When a solution to the problem is found, VK2ROT will be placed in service again.

The morse practice beacon VK2RCW (7400) has been relocated to a new site which is giving a much larger service area. Later this year the northern beaches repeater VK2RMB (6875) will be relocated at Terry Hills. The Liverpool Club has plans to develop VHF and UHF systems.

Other developments include establishing a repeater at Grenfell. This was the system previously proposed for Cootamundra by SWARS. Wagga is working on an ATV repeater for that city. In Sydney, an ATV signal on UHF channel 34 is transmitted by VK2DTK on most week nights from Lane Cove. At Wollongong, there is a new VHF repeater VK2RIL (7275) which covers their northern suburbs and a new UHF repeater on channel 8725 is proposed at the same site.

There are additional UHF systems licensed with VK2RUH (8425) in the Sydney southern suburbs, VK2RUT (8375) in the Blue Mountains and VK2RTK (8025) at High Range, south west of Sydney.

It is now time to compile the repeater listings for the next callbook. There are a few repeater systems observed as not having the official records up to date. The problem mostly concerns the site of these systems and those system operators have been advised accordingly. If you have not returned a repeater questionnaire, would you please complete the information requested and return the form to the State Repeater Committee.

There are now thirty four VHF and twelve UHF repeaters licensed in VK2.

Notes from Tim Mills, VK2ZTM, VK2 State Repeater Committee Chairman.

## VK2BWI SLOW MORSE SESSIONS

David Bell VK2NAW is taking a well earned vacation from the Sunday night slow morse practice sessions after four years of service. David is very well known on air not only for his fine CW but also for his consistently strong signal from Gospie, and his cliff-hanger stories in the CW text where aircraft are regularly plunging out of control or ships sinking in giant seas. Listeners were literally in suspense from week to week as David used to run his programme in the form of an ongoing serial. All good stuff and certainly designed to ensure the sweating listener had to jolly well keep up to find out what was happening next. Thank you David for a job enthusiastically and colourfully well done. We hope you will still find the time to do the occasional session for us.

We welcome to the Sunday session Doug, VK2NBB, an operator of wide experience who many will remember from some years past as a panel member. Thank you Doug for your interest and for dropping into David's shoes so keenly. The division and listeners are grateful to you for offering these skills for the benefit of so many and a warm welcome is extended to you Doug from all of us at VK2BWI.

The VK2BWI Slow Morse sessions are conducted by volunteers of the division each night, commencing at 0930 UTC using 3.550 MHz. You can assist by keeping clear of the frequency during these periods.

Notes from Ross Wilson VK2BRC, VK2 Slow Morse Co-ordinator.

## TAREE AMATEUR RADIO CLUB

The club held its AGM on the 8th of February and the following officers were elected.

President — Geoff Hunziker, Vice Presidents — Chas Withers and George Baker, Secretary — Mike Richardson, Treasurer — Trevor Clarke, WICEN Co-ordinator — Chas Withers, QSL Officer — Trevor Clarke, Social Committee — Bruce Cross and Wayne Eckert, Repeater Committee — Ted Eckert, John Farley, Geoff Hunziker, Chas Withers, Trevor Clark, Broadcast Officer — Bruce Cross.

The Club address is PO Box 712 Taree, 2430.

## COMING EVENTS

Official Opening, WIA Parramatta; 28th May at 2 PM. Port Macquarie Field Day; 11/12th June.

NSW members and clubs are invited to submit news items for inclusion in these notes to WIA NSW Division at PO Box 1066, Parramatta, 2150, marking the copy and envelope "For Mini Bulletin". Items for July AR must reach us by the 23rd of May.

Athol VK2BAD

AR



## FIVE-EIGHTH WAVE

Jennifer Warrington — VK5ANW  
59 Albert Street, Clarence Gardens SA 5039

At the Divisional Council meeting held on the 18th of March, John Mitchell VK5JMJ gave a detailed report on the WICEN involvement in the Ash Wednesday bushfires. One good thing that has emerged as far as WICEN is concerned, is that the Director of State Emergency Services has provided permanent facilities and antennas for WICEN use at SES Headquarters, for any future emergencies. This recognition of WICEN's usefulness has been hard won by John and his officers, and it only takes one act of stupidity to undo months or years of work. It was a couple of incidents like this, which has caused John to draw up a paper on the terms of reference of the Director. Council has moved that this be adopted.

Council has authorised the purchase of an Olivetti Praxis 35 and additional interface, so that we can do our own typesetting of the 'Journal'. Although this is initially a large cost, it is envisaged that we will recoup this within the next year, and that after this it will represent quite a saving on what we would be paying elsewhere.

The Kenwood Trophy for this quarter was presented to John Mount VK5EV for his services to the division as publications officer. Although John no longer appears at the monthly meetings, he still takes care of the ordering and postal requests. Our steep stairs, the weighty parcels, and his XYL Eleanor's poor health are the main reasons that John no longer attends the meetings. His stalwart helpers, Max VK5NMX and Archie L50014, still keep up the standard of service that John has set. I'm sure that everyone would agree with Council that John is a most worthy recipient of the voucher from ICS.

Sam VK5TZ has resigned as Co-ordinator of the panel of Morse Code Practice volunteers. We can't really complain though, seeing that he only took over in a temporary capacity a couple of years ago! Our thanks for your past efforts in this capacity Sam, and for the work that you continue to do for the division.

Dick Boxall VK5ARZ, our equipment supplies COMMITTEE, was conspicuous by his absence at the last meeting, due to an attack of shingles. We hope that you are now fully recovered Dick, and thank David VK5AMK and Graham VK5AGR for ensuring that parts were available at the meeting.

## DIARY DATES

24th May 'Getting started in RTTY' speaker John Mitchell VK5JMJ.

31st May 'Buy and Sell' starts at 7.30 PM.



# LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.



## ODES OF THANKS

7 Grimes Street,  
Auchenflower, 4066.  
7.2.83

Dear Sir,

Quite a number of VK4's owe thanks to Roy O'Malley (VK4ZQ) for carefully guiding them through a TAFE course for the AOPC theory.

Roy took raw recruits in hand and in just twenty four weeks at two hours per week (7-8pm) he had us reading Yaesu circuits component by component. His class of 1982 was a success story of nearly 50 percent pass.

Midway through the course the ditty "To VK4ZQ" was written to show we supported his efforts. At the course end "Again to VK4ZQ" was written to thank Roy for his efforts. Both were of course signed ANON.

I thought you might be interested in seeing proof that all are appreciative of the fine work done by Roy and all like him. Their interest in amateur radio is infectious.

Yours sincerely,  
Edward Seabrook VK4YAS  
(of the class of '82)

TO VK4ZQ

In the depths of the AOPC  
Some wondrous creatures lurk  
Such marvels as I and V  
With the watts doing all the work

The Wizard O'Malley pores  
Over huge and dusty tomes  
Cooking up Kirchoff's Laws  
And muttering "Ohms, boys, Ohms"

He'll boil up a complex circuit  
With voltages tossed all around  
And, somehow, mysteriously work it  
So amplification is found

The apprentices scribble — if only they knew  
(Though most of them try to ignore)

That dipoles, receivers, transmitters and Q  
Are dubious pleasures in store

At nine we release our attention  
Such relief is an amateur's joy  
But we'll master Marconi's invention  
And see you on two metres, Roy!

AGAIN TO VK4ZQ

It comes to us all in the end  
The circuits are coming alive  
Connections are humming, the students buzzing  
O'Malley's class will survive

Our dipoles are all radiating  
All vertically polarized  
Yet it's a wonder we tuned to his circuits  
For we all appeared mesmerized

Roy's badgered us all the semester  
He wants to see more on air  
I've Voltaire and Hertz in my corner  
So please Roy do not despair

The Yaesu and Kenwood are ready  
The antenna is swung and aligned  
It's a matter of switching the mic. on  
And beaming in strength 5 and 9

So thanks for the titanic effort  
To make us all amateurs new  
We'll owe it to your dedication  
To O'Malley VK4ZQ

## EXPERIMENTAL TRANSMISSIONS ON A LOW FREQUENCY

12 Albert Street,  
Oak Park, 3046  
16-2-83

The Editor,  
Dear Sir,

I would like to thank all those who gave assistance and reports on experimental low frequency transmissions following my letter in September 1982, Amateur Radio. The experiments were terminated with the start of daylight savings because of the increased summer noise level. The experiments will recommence shortly. I intend to contact all volunteer listeners before recommending experimental transmissions.

Although the response from volunteer listeners was very good inside the ground wave range, approximately 370 km, we have few volunteers outside this range.

We would like to hear from anyone who has receiving equipment with low noise level, freedom from spurious and capable of receiving below 200 kHz who live in a radius of from 350 to 1500 km from Melbourne. It would be an advantage if the listener has operating facilities on 80 and 40 metres for the purpose of reporting.

For anyone interested in participating in these experiments, we would arrange listening times and call back frequencies for reports. Interested persons please contact J A ADCOCK, (03) 306 2069 QTHR.

There will be a full report of the technical aspects of the activity published when complete.

Yours faithfully,  
John A Adcock  
VK3HCA

AR

## ITEM OF VALUE

The Editor,  
Dear Sir,

May I reply to the sincere concern expressed by Alex McMurray VK2AEV in AR February 83 re a medical emergency he handled on amateur radio.

I think that Alex, with no marine background handled the situation very well. Common sense is the basic essential and by phoning RMAS Albatross he had the experts involved immediately.

73  
Don Hopper VK4NN

## THANKS

Dear Sir,

This club expresses its appreciation of the fine work done by the Wireless Institute Civil Emergency Network (WICEN), and the State Emergency Service (SES), in providing communications during the recent tragic bushfires in South Australia and Victoria.

We congratulate all operators on the discipline and high standard of operating displayed in supplying these essential communications.

Once again it has been shown that the amateur service, its operators, and their equipment can play a valuable part in any local, state, or national emergency.

We are sure that the State, and Federal governments will be ready to publicly acknowledge these facts, and express their official appreciation of the work done, and so encourage the many persons involved in this valuable service.

Yours sincerely,  
Warren  
Secretary,  
Moorabbin and District  
Radio Club (VK3APC)

PO Box 123  
Sandy Bay  
5/3/1983

The Editor,  
Dear Sir,

The members of the Southern Branch, Tasmanian Division, of the WIA wish to commend you on the new format of the Amateur Radio Journal.

At each meeting the members always remark on the amount of content in your journal, and its presentation.

Yours faithfully,  
Ian Hill  
Secretary, Southern Branch, WIA

AR

## CABLE TV TRANSMISSION BEARERS

18 Ottawa Avenue,  
Panorama SA 5041  
16/3/1983

The Editor.

WIA is currently making representations to ensure that amateur radio is not affected by the introduction of cable TV in Australia. In making these representations, some important comparisons between coaxial cable and optical fibre as a transmission bearer could be stressed.

Polyethylene dielectric coaxial cables, in diameters ranging from 5 to 10 mm, have attenuation constants from 20 to 40 dB/Km at 10 MHz and from 60 to 150 dB/Km at 100 MHz.

Compare these coaxial cable figures to optical fibres, operating in the 1.3 to 1.6 micrometre wavelength region, which can now be made with attenuation constants of less than 1 dB/Km and which can support signal bandwidths up to 1000 MHz. Such fibres, complete with protective sheath, have diameters less than 1 mm and hence take up less space in cable ducts than coaxial cable. Furthermore, as optical fibre systems are expanded in development, installation costs are expected to fall to a fraction of those for coaxial cable systems.

As far as amateur radio is concerned, optical fibres have the important advantages that they do not generate electromagnetic fields and are immune to interference from electromagnetic fields.

Clearly, optical fibre is destined to beat coaxial cable as a transmission bearer, hands down. It would seem to be a lack of foresight if Australia allows yesterday's technology, of a coaxial cable television system, to be introduced. Optical fibre technology is already here and Australian industry could well do with a programme to develop it for national cable TV.

It is not the prerogative of WIA to recommend whether cable TV is needed in Australia or

otherwise, but if it is to be introduced, WIA must encourage a system which does not interfere with amateur radio reception and is immune to fields from amateur radio transmitters. It is therefore in the interests of amateur radio to encourage optical fibre as the transmission bearer. Fortunately, optical fibre has advantages on all counts and WIA should stress these advantages to those authorities delegated to make the decision.

Lloyd Butler VK5BR

AR

## SEARCH AND RESCUE

The Editor,  
Dear Sir,

I refer to the letter from Alex McMurray (VK2AEV) in your magazine's February 1983 edition and would like to thank the writer for his kind remarks.

This centre often becomes involved in Marine Search and Rescue (SAR) incidents where the only communication with the scene is through Amateur Operators. As the Australian Marine Search and Rescue authority, we maintain a continuous operations centre to coordinate assistance to those that need it.

Your readers may have cause to report incidents such as that outlined in Mr McMurray's letter and a reverse charge telephone call to us will ensure early action to alleviate the distress. The number is Canberra (062) 47 5244.

We have worldwide contact with other SAR authorities who are notified if their assistance is required.

Yours faithfully,

H. K. Duncan,

Director Operations,

Australian Coastal Surveillance Centre

10 March, 1983.

AR

## ASH WEDNESDAY

46 Fore Street,  
Whittlesea 3757  
28/3/1983

The Editor,  
Dear Sir,

Although the devastating results of "Ash Wednesday" are slowly fading in physical terms, many amateurs will not forget the chaos and confusion that reigned during that day.

Amateurs throughout Victoria and South Australia have been praised, and rightly so, for their excellent service in handling communications, for and on behalf of other services.

But let us, as amateur radio operators, be wary of sitting back on our haunches until the next time our services are required. Although our operations were classed as "excellent", one must clarify this description and say that they were "adequate".

The regular Victorian WICEN members, totalling about thirty at the best of times, were indebted to Peter Mitchell VK3ANX and Colin Pomroy VK3BLE for advice and instruction on message handling for years prior to the "Ash Wednesday" incident. Operators who for many years had not involved themselves in WICEN directly appeared "out of the woodwork", and thankfully provided enormous support to the thin core of WICEN.

Now that the circumstances have reverted back to normal, let us hope the majority of amateur operators do not "go back into the woodwork", and see fit join WICEN, participate in exercises, learn proper message handling techniques and *logging*, and ensure categorically the acceptance of the term "EXCELLENT" for our service.

Yours fraternally,  
Mark J Stephenson VK3PI

AR

## TECHNICAL CORRESPONDENCE

28 Immarna Avenue,  
Woolongong, 2500  
23-2-83

The Editor,  
Dear Sir,

With reference to Theo Vidler's (VK1KV) comments on 290R mods to stop the battery "blow ups", I would like to make the following points.

Upon inspection of my 290H I found a diode already soldered from the ext DC jack to ground. As pointed out this will provide protection except when used with (-) earth vech AC with the co-ax braid and VK1KV's mod to exacerbate an already over-taxed battery system.

Battery volts = 8 x 1.5 = 12 volts from dry cells

Battery volts = 8 x 1.2 = 9.6 volts from NiCads

Total Drop = 12 - 9.6 = 2.4 volts

Add 0.6 volt for diode fwd volt drop  
= 2.4 + 0.6 = 3 volts

This causes a dramatic reduction in output power whilst portable.

A better solution is a small slide switch. The noise blanker switch on my R16 is usually left on so this would appear to be a suitable switch. Just connect in series with the batteries.

No damage to the set can occur if you switch it on with the batteries isolated. It just will not work.

In my view, the added inconvenience is justified by having full power available. Sure, you can forget to turn it off; but as I use my rig only occasionally portable this does not matter.

Yours faithfully,  
Peter Laughton,  
VK2XAN

AR

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# IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE

## NOTES ON THE PREDICTIONS

The mode of propagation used by IPS in compiling their predictions are reflected in the bar charts used to convert the Graflex symbols into a graphic picture.

When generating the Graflex charts (reproduced in a number of publications) the following symbols are used.

- 1 "—" — Propagation is possible but probably less than 50% of the days of the month.
- 2 "%—" — Propagation is possible between 50% and 90% of the days of the month.
- 3 "F" — Propagation is possible by the first F mode on at least 90% of the days of the month unless there is a severe ionospheric disturbance.
- 4 "M" — Propagation is possible by both first and second F modes. The strongest mode is normally the first mode, but the vertical aerial pattern may influence the mode received.
- 5 "A" — High absorption, ie above the absorption limiting frequency but probably too close to it for good communication.
- 6 "X" — Complex mixtures of modes including the second E mode.

These are the most significant types we encounter. The full lines or bars on the chart cover 2, 3, 4 taking 5 into account. The broken lines or bars are depicted by 1. 6 is extremely hard to verify and is not taken into account.

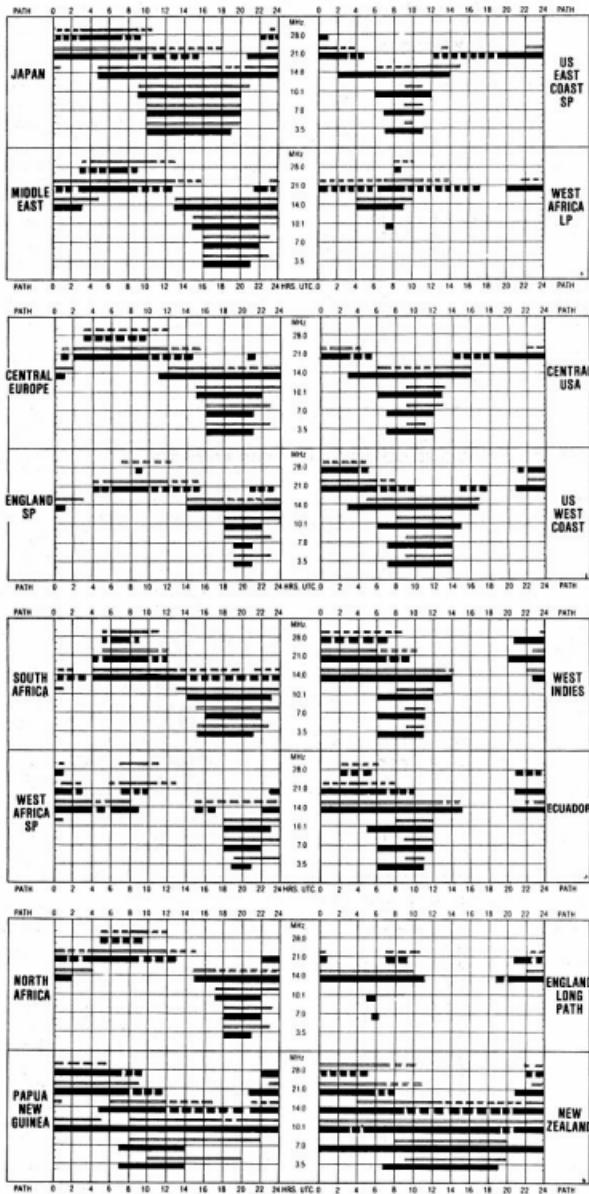
The paths from Eastern Australia are based on Canberra. The paths from West Australia are from Perth. Suitable allowance should be made on Eastern paths for geographical differences. Times, as much as 1 hour difference between Victoria and Queensland in band openings occur. Often there is no signal available in one State, whereas the opposite effect occurs in the other State, they get the lot. Marginal differences produced by layer tilt and varying degrees of ionisation can be very frustrating.

Generally the predictions show that time of day when the path should be open between the two areas. All other factors notwithstanding.

### LEGEND

- FROM WESTERN AUSTRALIA
- FROM EASTERN AUSTRALIA
- BETTER THAN 50% OF THE MONTH, BUT NOT EVERYDAY
- LESS THAN 50% OF THE MONTH.

PATHS — Unless otherwise indicated [ie LP = Long Path] all paths are Short Path.



Predictions courtesy Department of Science and Environment IPS Sydney.  
All times universal UTC.

## GEOMAGNETIC ACTIVITY FOR YEAR 1982

### Ap — PLANETARY INDICES

MONTHLY	MEANS	HIGHEST	DAILY	LOWEST	DAILY	MOST DISTURBED DAY	DAYS OVER Ap 15
1/82	12	34	31/1	3	14/1	31/3	8
2/82	33	60	2/2	6	16/6	2/2	25
3/82	18	107	2/3	3	6/3	2/2	11
4/82	22	61	10/4	6	14/4	10/4	19
5/82	17	56	28/5	2	23/5	28/5	12
6/82	22	62	13/6	6	5/6	13/6	20
7/82	30	153	14/7	2	4/7	14/7	23
8/82	21	107	7/8	3	15/8	7/8	21
9/82	36	199	6/9	9	29/9	6/9	16
10/82	18	35	29/10	5	24/10	29/10	16
11/82	21	83	24/11	4	7/12	24/11	15
12/82	21	62	17/12	2	1/12	20/12	18

### CYCLE 21 RUNNING SMOOTHED NUMBERS TO DATE:

	1976	1977	1978	1979	1980	1981	1982
JAN		16.8	61.3	123.7	163.8	140.2	136.7
FEB		18.2	64.5	130.9	162.6	141.6	132.8
MAR		20.0	69.6	136.5	161.0	143.0	128.6
APR		22.2	76.9	141.2	158.7	143.4	123.8
MAY		24.2	83.2	147.2	156.3	142.9	119.3
JUN		26.4	89.4	153.0	154.7	141.4	116.7
JUL	13 min	29.0	97.4	155.0	152.7	139.8	
AUG	14	33.4	104.0	155.4	150.2	141.1	
SEPT	14	39.2	108.4	155.7	150.1	142.8	
OCT	14	45.6	111.1	157.8	150.2	142.0	
NOV	14	51.8	113.4	162.3	147.6	138.7	
DEC	15	56.9	117.8	164.5 max	142.7	137.6	

### SUNSPOT

MONTHLY	MEANS	HIGHEST	DAILY	LOWEST	DAILY
1/82	110.7	237	31/1	46	11/1
2/82	162.6	258	1/2	97	23/2
3/82	153.7	182	27/3	116	9/3
4/82	122.5	152	12/4	75	30/4
5/82	81.4	130	27/5	46	3/5
6/82	110.4	147	10/6	32	29/6
7/82	102.6	272	17/7	19	28/7
8/82	105.9	161	9/8	55	1/8
9/82	119.2	176	4/9	78	12/9
10/82	94.3	164	2/10	39	18/10
11/82	98.5	141	22/11	71	27, 29/11
12/82	126.4	194	12/12	62	31/12

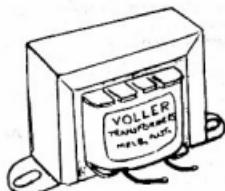
ACKNOWLEDGEMENTS: Sunspot Data, Sunspot Index Data Center, Brussels.  
Geomagnetic Data, IUGG Assoc. of Geomagnetism and Aeronomy, Gottingen.

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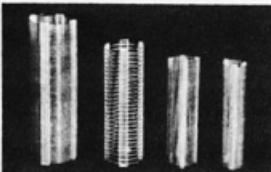
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# Obituaries

## JOHN CRITCHLEY GRAHAM G3TR

His many friends in VK/ZL will be saddened to hear of the passing, whilst on holiday in Tenerife, of John Graham, G3TR.

For many years John has been one of the outstanding UK signals on 20m, resulting in thousands of VK/ZL contacts.

John started a long association with amateur radio with the artificial aerial collision of 2BQR, first obtained in the mid 20s. GM3TR first came to air in 1938 and has been regularly heard, apart from the war years, ever since passing through all British call areas as he moved around with his work.

John's many hobbies in earlier years included fishing and a long association with motor racing. Indeed he used to drive Riley cars at Brooklands in the heyday of that particular track. His other interests included ballroom dancing and a lifetime interest in everything connected with aviation.

John became associated with Air Traffic Control in the very early days and in fact held Licence No 13, finishing his career as Air Traffic Control Officer in Charge of London Gatwick Airport prior to his retirement some fifteen years ago.

Following retirement John had more time to become involved in the administrative side of amateur radio and served on many RSGCB committees, finally being elected President during 1968.

More recently, John was heard daily on the 20m band where he particularly sought out VK/ZL contacts.

John is survived by his wife Else, son Eric and daughter Britt to whom we offer sincere condolences. 20m is just not the same without his voice.

Ren VK6RV

## ALF SEEDSMAN VK3IE

Alf was born in 1904 and passed away 8 January 83. He was educated as a Civil Engineer at Melbourne University, and experimented since his late teens with spark transmitter and later with single valve sets and mainly hand built components. Licensed in 1947 as VK3IE (succeeding the late Jack Mann as call holder), he was well known on 80, 40 and 20 with his Type 3 Mark 2 and occasionally an 'A' Mix 3. Always a 'home-brew' amateur, he converted to 20m when the move away from AM set in. It was in his last three years of operating that he used a commercial unit.

Some of his fondest memories were the 80 metre transmitter hunts when hidden by the late Col Gibson (3FO), teaming up with the late Jack Duncan (3V2) trying to beat Len Moncur's VK3LN family to the transmitter site.

He often recalled two TV demonstrations he had seen, one by 3LN and 3V2 at a Hobbies Exhibition in the early 1950s, and a special one by Peter 3BX later in the 1960s, and his respect for the magnificent equipment assembled by Joe Rogers (ex 3TO).

He served as a WIA Victorian Division broadcast announcer in the late 1940s, on Divisional Council, and later on the Federal executive.

He was well known to the VKO fraternity in the 1960s as his son Don (DOS) spent two separate years on the Antarctic Continent.

To the many friends, too numerous to mention that he made in his 36 years of operating, I am sure he is sorry that he could not have that one last contact to say goodbye.

Don Seedsman VK3IE

AR

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## WANTED

Due to the imminent retirement of Bob Arnold VK3ZBB a Contributing Editor for the AMSAT Australia column is required.

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TRANSEIVER — AM only needed by student for experiments. Will pay any realistic price — 6 or 2 metres only. Prefer commercially built VFO tuned superhet with circuit diagrams. John VK2DVMW, PO Box 57, Bexley North 2207 or Ph: (02) 57 6567 AH.

YAESU FRG 7700 — If it can be done, I would like information on how to convert the clock of the Yaesu FRG 7700 to a 24-hour clock. Prepared to pay. Paul Casotti, L20173, Box M60, Post Office, Newtown South, 2042, NSW.

YAESU FT-7B in good condition, preferably with a mobile mount and owners manual. John VK2DFC QTHR or Ph: (069) 62 5547.

## WANTED — VIC

CONVERSION DETAILS of FL2000 Linear Amp for 160 Metres. VK3BAX QTHR.

MOTOROLA MPU CLOCK type MC6871, frequency 14.4 kHz as used in D2 evaluation kit. VK3ALY QTHR. Ph: (03) 589 4275.

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V F O TO SUIT FT-750 ALL BANDS. Contact John VK3VGP or Ph: (03) 398 1564 AH.

## WANTED — QLD

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YAESU FTV-107R, 430 MHz unit, working or not, any reasonable price paid. John VK4BTX. Ph: (074) 22 2533 BH (074) 22 1959 AH.

## WANTED — WA

BZ4 AWA power supply and receiver circuit diagrams. Unlabeled VFO 8010, ext spkr 8120, DC cord and plug. Must be good condition all letters answered. C Chew, PO Kirup 6251.

## FOR SALE — ACT

ICOM 551 Tcvr 6 m all mode 10 W with FM board \$500. Icom 260A 2 m all mode 10 W \$250. Glen VK1KAA QTHR. Ph: (062) 54 8002.

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**YAGI 3EL MONOBAND** beam for 20m VK3BWW design brand new \$100. Palomar IC keyer \$80. Dentron Jr monitor ATU \$50. Kenwood low pass filter LF30A \$10. Beam antenna handbook Orr \$3. All about cubical quad antennas Orr \$3. All prices firm. VK2DET QTHR. Blackheath, NSW. Ph: (047) 87 7003.

## FOR SALE — VIC

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